

The IRON AGE

May 8, 1958

A Chilton Publication.

The National Metalworking Weekly



Leon F. Miller

Let's Reappraise

Foundry

Automation P. 97

**Is Labor Pricing Itself
Out of the Market? — P. 57**

**Rush Orders Forecast
Steel Inventory Crisis — P. 62**

Digest of the Week P. 2-3



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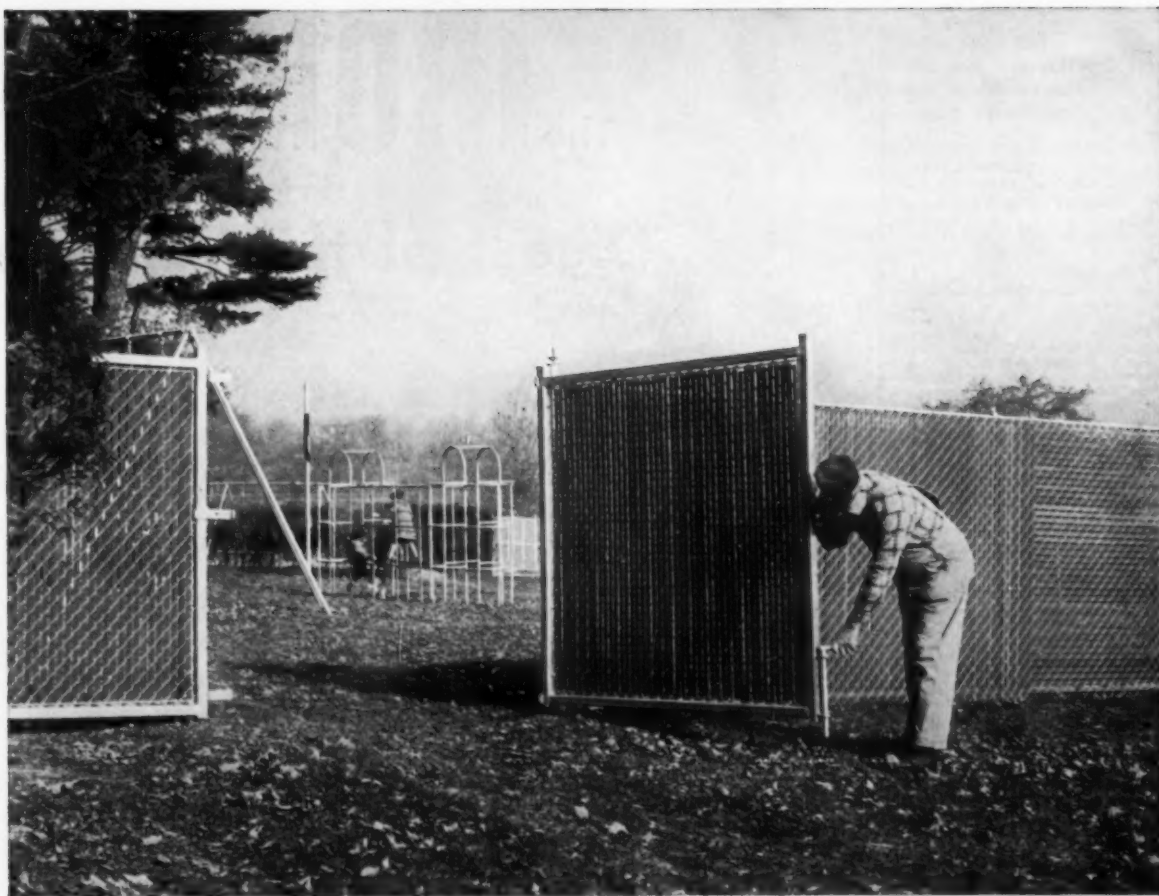


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The IRON AGE

May 8, 1958—Vol. 181, No. 19

Digest of the Week in

*Starred items are digested at right.

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NEWS ARTICLES

ON THE LABOR FRONT

A Hard-hitting Appraisal—Tom
Campbell, The IRON AGE's
editor-in-chief, takes a hard look at



the current auto labor hassle and
makes some predictions on the '59
contract negotiations in steel. P. 57

FIRST QUARTER EARNINGS

Prove Steel's Efficiency — There
was a silver lining in the lean first
quarter. Steelmakers learned they
could operate in the black while
turning out steel at only 50 pct of
capacity. P. 60

STEEL

Surge in the Air—Order books
are still slack, but steel men predict
an upturn. They are basing their op-
timism on past performance, and
the fact that they can't handle many
more rush orders. P. 62

COST CUTTING

Control Is One Answer—A new
electro-mechanical system links pro-

Metalworking



duction machinery to a central control room. Information is continuously conveyed from the machine. When something goes wrong, immediate action is taken. P. 64

TAX CUTS

No Hope for Individuals—Best chances of tax cuts this year lie in excise or corporate taxes. A bill must be enacted or automatic cuts go into effect. P. 79

FEATURE ARTICLES

FOUNDRY SCHEDULING

Use Close Control—Good work alone doesn't make a jobbing foundry prosper. Customers are demanding faster service and on-time deliveries as well. It takes a control system flexible enough to give leeway when things go wrong. P. 100

INSPECTION TEAM

Serves Supplier and User—Rejected shipments are a big headache to both suppliers and manufacturers. A new outfit set up to correct deficiencies finds itself in demand for fast versatile service. The larger the part or the greater the number of pieces, the better chance the firm has of rendering service. P. 104

LAMINATED PLASTICS

How to Machine—Part two of a three-part feature, this section deals with shearing, sawing, cut-off, turning, drilling, tapping and threading, milling, and gear cutting. While

laminated units are easy to machine, a few special tricks can make a big difference in quality. P. 106

BRAZING FILLER METALS

For High Temperatures—A number of newer type metals have been developed to match the ever increasing temperature demands of rocket and jet engine parts. P. 110

SPRAY PAINTING UNIT

Speeds Production—A conveyORIZED electrostatic spray painting setup has doubled production rate while reducing paint consumption. It was the solution to a bottleneck in production of metal housings demanding many different color schemes. P. 112

MARKETS & PRICES

STAINLESS

Market in Space—Use of stainless as shell of Atlas ICBM underlines market for stainless in rocket and missile field. Its strength, temperature and corrosion resistance make it a leading material. P. 61

NEXT WEEK

BUSINESS BAROMETER

Advance Look—The tool and die industry's advance position makes it a good business barometer. Next week's special report gives a closeup of the tool and die outlook, as interpreted by leading tool and die manufacturers.

▼
FOUNDRY SENSE: Some words of caution regarding automation in the foundry are offered by Osborn Manufacturing's Leon F. Miller. He sees demand for speed without regard to other factors as a trap that could hamper progress. P. 97

APPLIANCE FORECAST

Boom in the '60s—The entire appliance industry is banking on record sales beginning in 1960. It will mean more spending for capital equipment, new plants. P. 66

AUTO PROFITS

They're Evaporating—First quarter reports show big drops in net earnings by the Big Three automakers. It dashes UAW's hopes for making something of its profit-sharing demands in coming bargaining session. P. 74

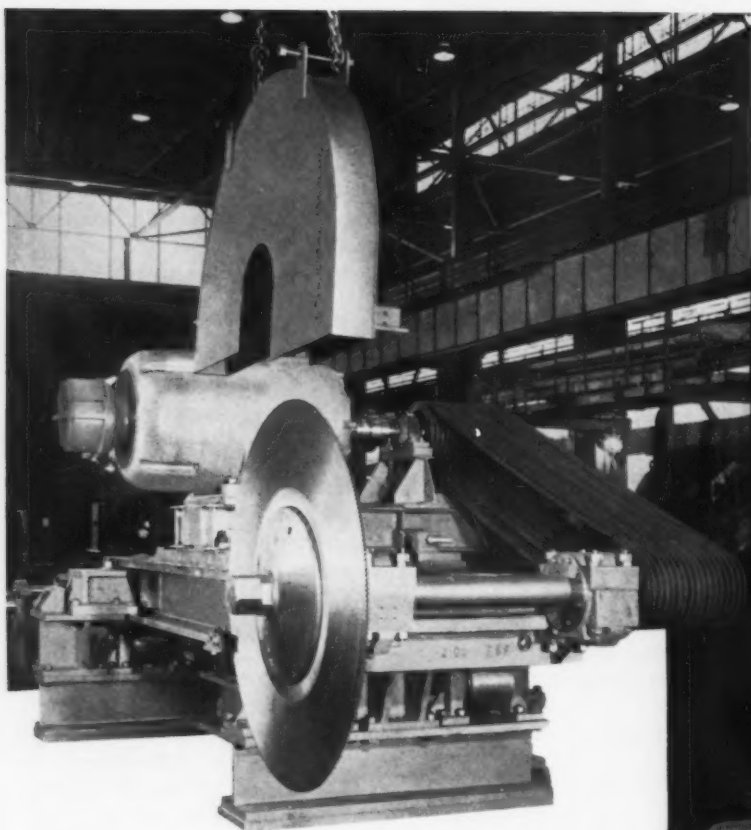
HIGHER POWERED TOOLS

They're On the Way—The age of "electromotion" in machining is coming, experts say. They predict use of more automatic tools packing more power will increase worker productivity. P. 83

APRIL TURNING POINT?

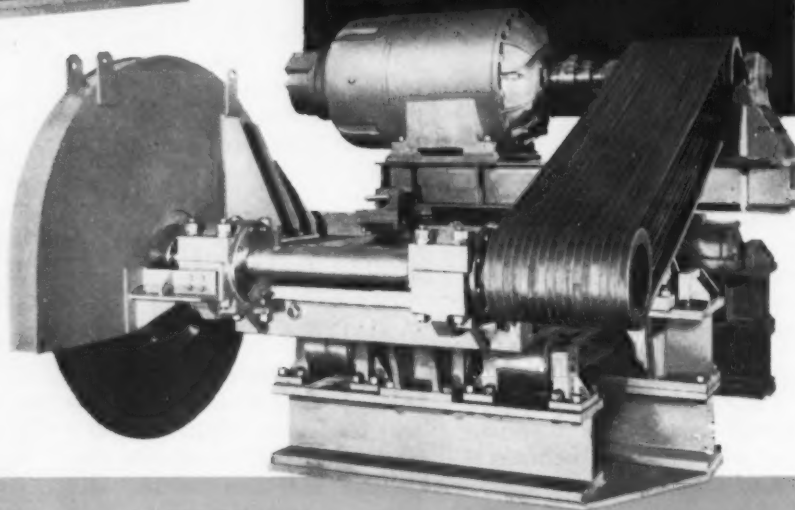
Mills Are Hopeful—When the year is reviewed, April could show up as the turning point in the steel market. At least, that's the way one leading mill looks at it. P. 135





Auxiliary Equipment by Pittsburgh

HOT SAW



Ferrous and non-ferrous metal processing plants have numerous pieces of auxiliary equipment built by Pittsburgh Engineering Division. The Hot Saw illustrated typifies the manufacturing versatility of our shop. Specifications include: cuts up to 7" O. D. carbon steel solid rounds at approximately 1000° F.; direct belt drive; hydraulic feed control; and low maintenance costs. Consult Pittsburgh for your special requirements in auxiliary mill equipment.

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castings from 1 lb. to 100 tons"



BEFORE BRUSHING

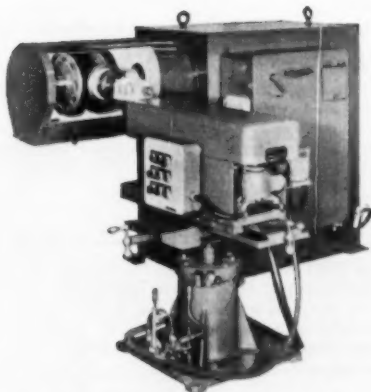
Port plate for hydraulic pump has loose burrs and sharp edges. Cost to remove these by hand: 14¢



AFTER BRUSHING

All burrs are thoroughly removed and surface junctures blended to close uniformity. Cost with Brushmatic: 1.3¢

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OSBORN BRUSHMATIC® 3-A
operates on preset time cycles.

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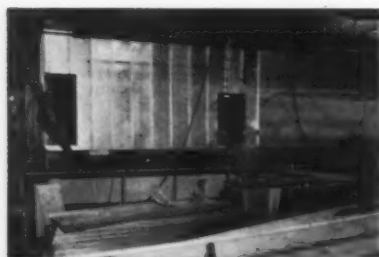
BRUSHING MACHINES • BRUSHING METHODS • POWER, PAINT AND MAINTENANCE BRUSHES • FOUNDRY PRODUCTION MACHINERY

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Where Do We Stand? We Must Make up Our Minds

We have so many soothsayers these days that the important question of getting out of the recession is being treated as a simple process. It isn't. And the more we see that it isn't the more we will have to decide between painful methods and the panaceas.

There is a certain amount of thinking which is reminiscent of the early 30's. There is also some lack of fortitude. But that isn't too unusual in these days of the pill-for-this-or-that.

Basically, the present recession is a period of correction for previous excesses. That idea or rule is now called old fashioned by many of our leading economists and statesmen. The "old way" would be to let nature and discipline take care of the correction—with a minimum amount of help by government.

The big argument comes up over the question, "How much help?" It is raising a far greater problem in men's minds than is generally supposed. That is why the current debate over what to do takes on a more complex stature each day. The boy standing on the burning deck eating peanuts had a ball compared to problems faced by the President and his advisers.

This is so because more than recovery from

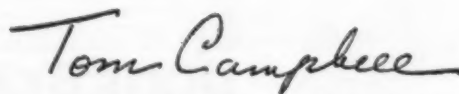
the current recession is involved. If we don't snap back industrially by this fall the air will be rent with "I told you so's." But more than that: The hysteria may then hit the man on the street. Then will come "plans" to make current ones look ultra-conservative.

While the debate goes on, Mr. Khrushchev is watching. The challenge from Russia is trade, economics, and a fast-growing Russia. That, in the face of our depressed business levels, makes fine statistical propaganda. This is by no means a small item in our overall dilemma today.

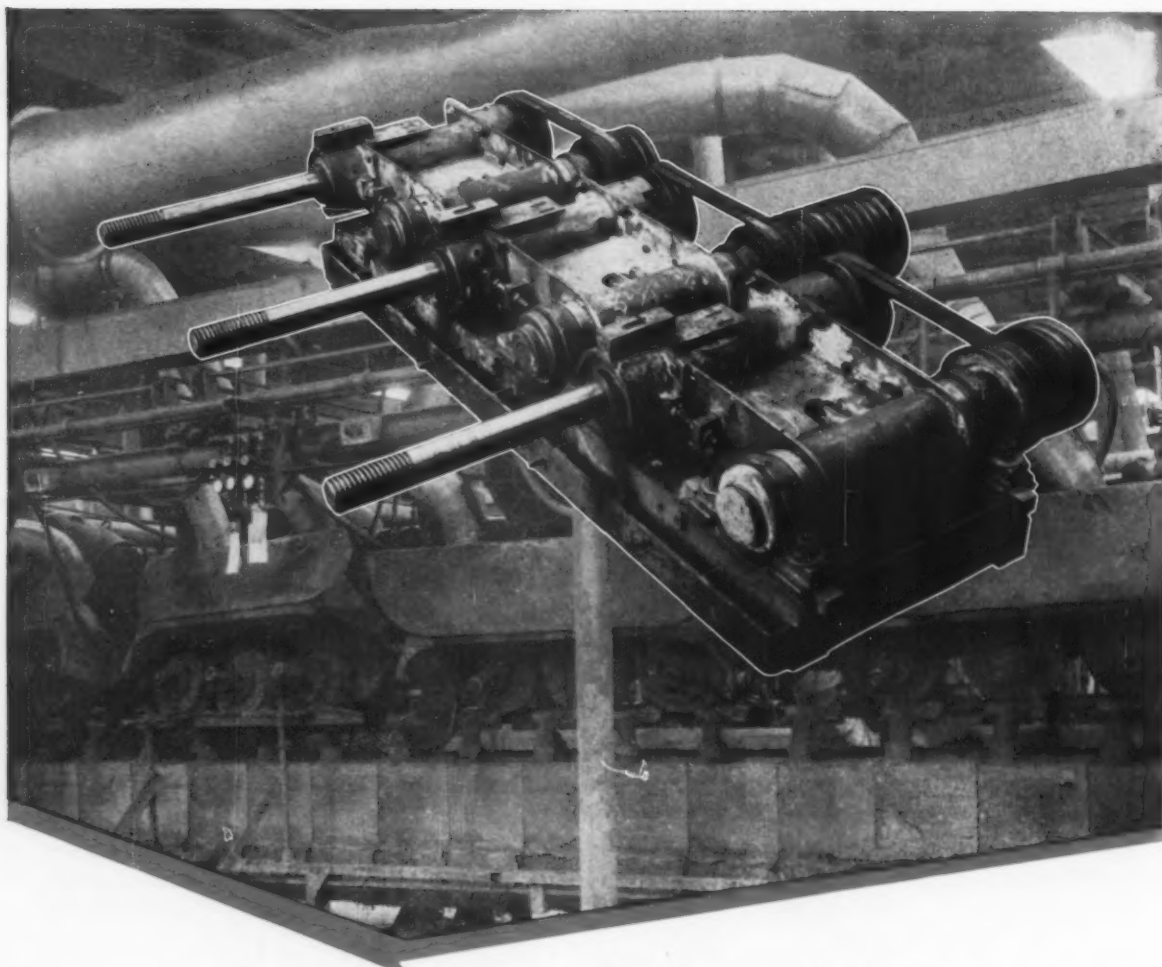
We might as well admit it: The big battleground today is between those who favor the old order of economics with its personal discipline and those who feel that government can and should "protect" the workers—and the businessmen. Let's make no mistake about this; there are many businessmen lined up on the side of "planned" intervention.

We may never get the chance to see what the old-fashioned methods would do. Long before that time the politicians and those who honestly think they need the helping hand of government may get their way.

We must decide quickly where we stand.



Editor-in-Chief



Here's a Bearings, Inc.
idea that saved our customer \$3,000
in labor, maintenance and parts in 7 months

Only an authorized bearing distributor such as Bearings, Inc., with the experience and facilities we have at our disposal, could have designed and supplied the special housings that hold the flinger sealed bearings that now have effectively solved this difficult bearing maintenance problem.

A well known automotive stamping plant designed and built this tandem buffing head (shown above) for its own use. Due to the extremely high concentration of metal dust from the buffing and polishing wheels conventional bearings had a very short life. Over 300 bearings were purchased

in 7 months. Downtime due to bearing failure was very costly. The actual labor and material cost of replacing the bearings during this period exceeded \$3,000! Since the new bearing units designed by Bearings, Inc. (shown enlarged) were installed, no bearing failures have occurred and no replacements have been installed.

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LETTERS FROM READERS

Helpful Uncle

Sir—I refuse to believe that the American public will not nor cannot endure short dislocations in the economy and prefers instead mass dependency upon the state. (IRON AGE—Washington report, April 24, p. 105.)

If this is so then we should surely hang our heads in shame and re-examine the nature and meanings inherent in a free society. I have listened to, and spoken to, people in all walks of life in the months since we have experienced the recession and I have found no clamor for mass intervention by government.

Calling for help clearly isn't free enterprise or the old pioneer spirit—but it is a fact.—T. C. Humes, Pittsburgh Consolidation Coal Co., Pittsburgh.

A Word for Ralph

Sir—Your editorials are always appreciated by this writer. They reflect a deep understanding of people and economic conditions of our country. I must admit that your viewpoints influence my own.

I'm also pleased to see the articles by Ralph Eshelman, now your Engineering Editor. Ralph is a good friend of mine, whom I came to know while he was with the American Society of Tool Engineers. I am sure he will be a valuable member of your staff.—G. Ben Berlien, Industrial Steel Treating Co., Oakland, Calif.

Tension Aid

Sir—We congratulate you on the publication of your excellent article on "Are Tensions Getting You Down" (March 13 issue), and would appreciate three reprints.—C. Schiebold, Bearings Co. of America, Div. of Federal-Mogul-Bower Bearings, Inc., Lancaster, Pa.

Belt Grinders

Sir—In the Mar. 20 issue of The IRON AGE, in reply to a request for information on manufacturers of belt grinders and polishing machines, you mentioned two or three companies but did not mention Mattison Machine Works.

As you know we manufacture an abrasive belt grinding and polishing machine. We also have a reciprocating table as well as a straight-thru feeding arrangement. And we manufacture an internal tube grinding and polishing machine using abrasive belts.—W. C. Hagstrom, Adv. Mgr., Mattison Machine Works, Rockford, Ill.

■ Sorry Mattison was originally omitted.—Ed.

Sir—Your editorial in the Apr. 10 issue of The IRON AGE was so good, I would appreciate five copies to distribute. I hope some of our senators and congressmen read it. It was very timely.—H. E. Eberhardt, Gould & Eberhardt, Inc., Irvington, N. J.



"Let's quit playing, Millie. I just ordered sixty cutting machines and a voice said O.K."

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Temper!



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FATIGUE CRACKS

Eye on the Apple

Company diversification is usually logical. Subsidiary firms are bought in allied lines, such as mining or shipping.

That's why our alert nonferrous editor did a double-take on reading Alcoa's annual report. He found the Columbia River Orchards, of Wenatchee, Wash., listed as a wholly owned subsidiary.

An apple orchard? he asked himself. Why do they need an apple orchard? So he checked on it. Alcoa's answer: The fruit trees are on land surrounding its processing plant at Wenatchee.

There seemed no reason to suspend fruit-raising when Alcoa bought the land. So the status remained quo. And an aluminum producer added apples to its list of products.

Puzzlers

Judging from the many returns

from the Amoeba puzzler (April 10 issue), it wasn't much of a poser. The answer? — 39 minutes. The winners: W. Hanna, A. Kaack, and E. Novomesky, Curtiss-Wright Corp.; Bertha Frazey, Mound Rose Cornice & Sheet Metal Works; Sherman E. Telling, The W. S. Tyler Company; Herbert Chapman, General Steel Wares; Mary Shrout and Alice Schmidt, McDonnell Aircraft Corp.; Mrs. Thelma Jackson, Ohio Seamless Tube Division of Copperweld Steel.

Also, Frank Hunter, U. S. Naval Shipyard, Brooklyn, N. Y.; Arnold J. Hanson, Jr., Amay Steel Company; F. A. Bellamy, Henrite Products Corp.; R. H. Darrell, Bell Aircraft Corp.; E. A. Chimmer, Flint, Mich.; Herbert Klebaum, Republic Steel Corp.; The Rate Department of Link-Belt; W. C. Cropper, American Steel Band Company; A. B. Retallick, New York, N. Y.; "Little" Rose Lantos, Industrial Welding Co.

Giant Thermos Will Store Missile Fuel



TANK WITHIN A TANK: Liquid oxygen for Air Force Thor missile will be stored in this tank built by Standard Steel Corp. of Los Angeles. It's light enough to ship by air, yet holds 170,000 pounds when full.

**DEFIES HEAT
ABRASION...
FATIGUE...
LEAKS**

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are constantly working to bring industry the most efficient and economical high temperature refractories and insulation materials. To obtain information about Illinois Clay Products Company insulations and refractory materials for the foundry and steel-making plants, write:

**ILLINOIS CLAY
PRODUCTS CO.**

MAIN OFFICE: Joliet, Illinois; Barber Building

SALES OFFICE: Chicago, Illinois; 208 S. La Salle St.

COMING EXHIBITS

Foreign Metalworking—May 7-17, Coliseum, New York. (U. S. World Trade Fair, 331 Madison Ave., New York 17.)

Western Material Handling Show—May 8-10, Great Western Exhibit Center, Los Angeles. (Information: 2809 Sunset Blvd., Los Angeles 26.)

Southwestern Metal Show—May 12-16, State Fair Park, Dallas. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

Foundry Show—May 19-23, Public Auditorium, Cleveland. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.)

Packaging Show—May 26-30, Coliseum, New York. (American Management Assn., 1515 Broadway, New York 36.)

Materials Handling Show—June 9-12, Public Auditorium, Cleveland. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Automation Show—June 9-13, Coliseum, New York. (Richard Rim-bach Associates, 845 Ridge Ave., Pittsburgh 12.)

MEETINGS

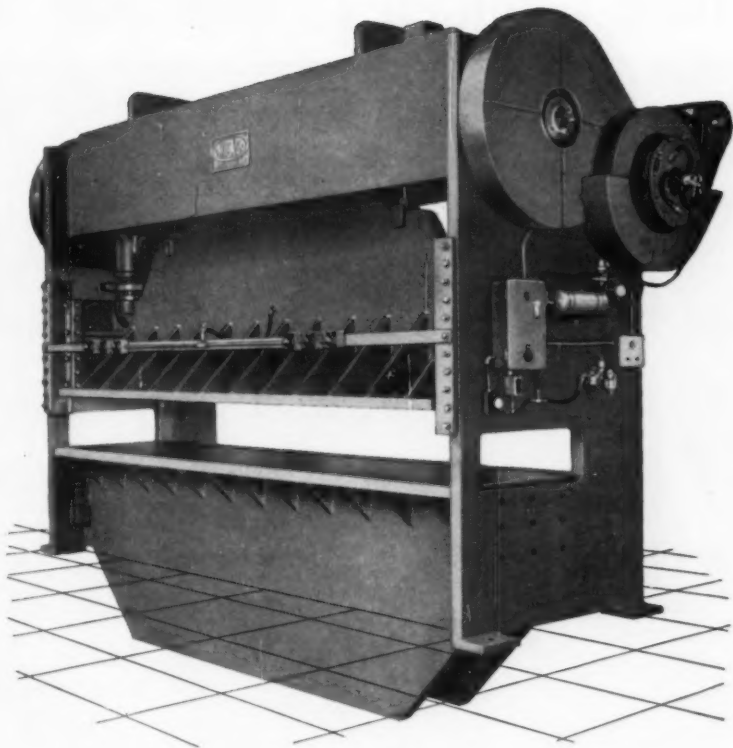
MAY

National Assn. of Purchasing Agents—Annual convention, May 11-14, Conrad Hilton Hotel, Chicago. Society headquarters, 11 Park Place, New York.

American Steel Warehouse Assn., Inc.—Annual meeting, May 11-14, Riviera Hotel, Las Vegas. Society headquarters, 540 Terminal Tower, Cleveland.

Instrument Society of America—Annual symposium on instrumental methods of analysis, May 12-14, Shamrock-Hilton Hotel, Houston, Tex. Society headquarters, 313 Sixth Ave., Pittsburgh.

Society for Experimental Stress Analysis—Spring meeting, May 14-
(Continued on P. 16)



PRESSES

STRAIGHT-SIDE TYPE

*large die area
capacities up to 400 tons*

This is a typical model of CHICAGO straight-side-type presses used for multiple punching, notching, and trimming operations. This press with a die area of 48 inches by 198 inches has a capacity of 200 tons.

Complete recommendations for any job on request.

0674



Press Brakes • Straight-Side-Type Presses • Press Brake Dies
Hand and Power Bending Brakes • Special Metal-Forming Machines

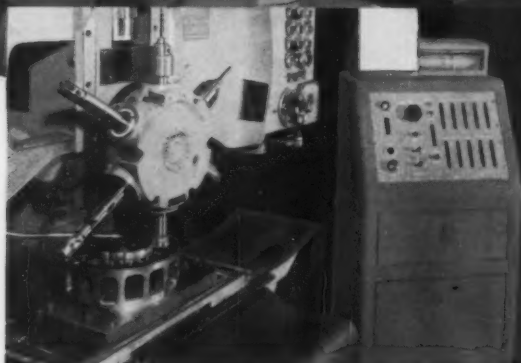
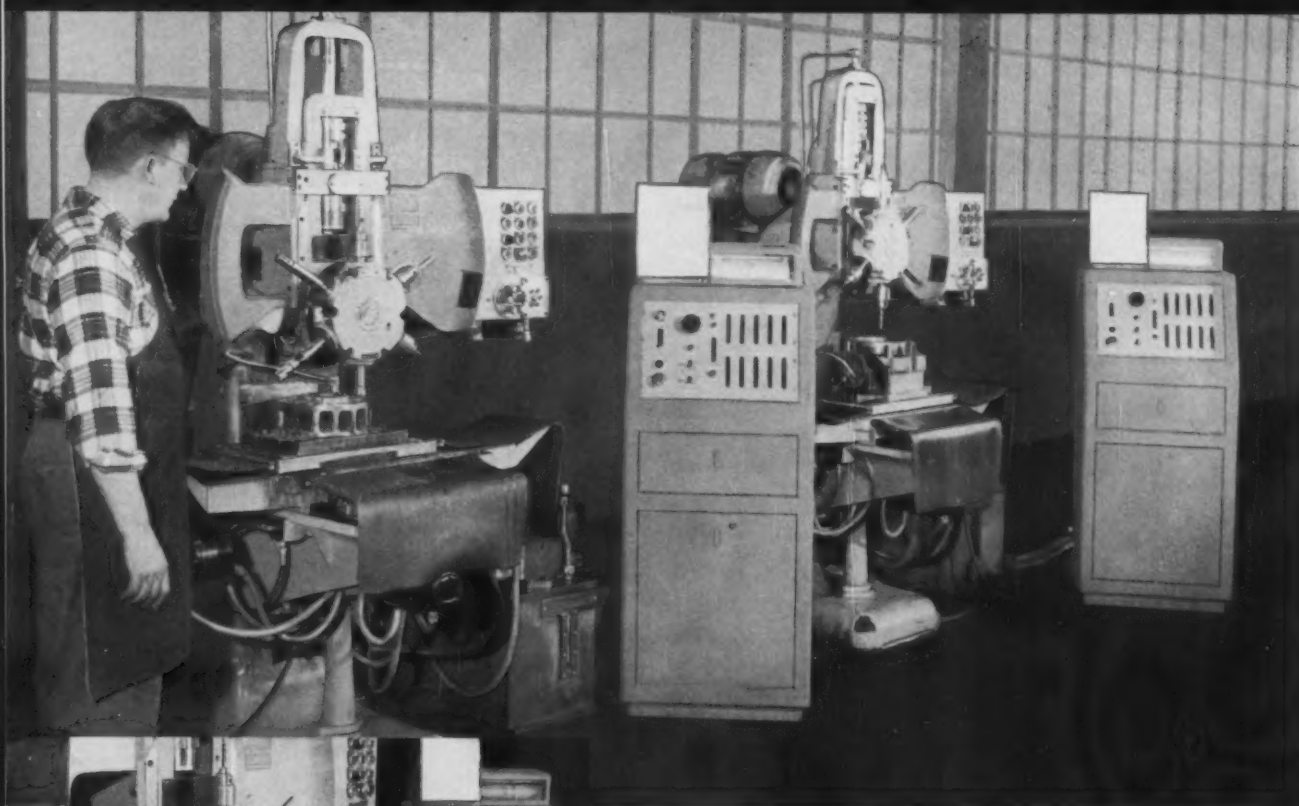
DREIS & KRUMP

MANUFACTURING CO.

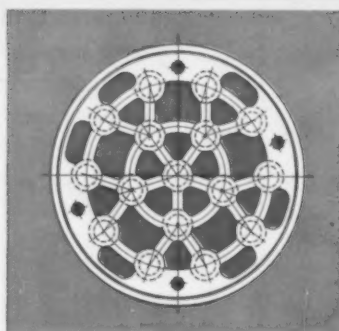
7430 South Loomis Boulevard, Chicago 36, Illinois

✓ time reduced 75% ✓ \$500 fixture eliminated

Burgmaster Electropoint



Close-up Showing Standard Self-centering air vise and Set-up for Part A of 8" Valve Seat Produced on 1st Burgmaster—All Holes are machined within .0025" of true position—Produced in lots of 50-200.



Part B, Stop Plate matches with Part A, produced on second Burgmaster—Both Machines run by one Operator who also inspects parts.

Burgmaster, the largest manufacturer of Turret Drilling Machines, offers the 2BH-T, $\frac{3}{4}$ " capacity in steel, and 3BH-T $1\frac{1}{2}$ " capacity in steel machines with electropoint automatic tape controls.

2BH-T \$25,000—3BH-T \$46,000

Specialists in High Production Turret Drilling



1C Manual
Power Index
 $\frac{3}{4}$ " Capacity



2B Manual
Power Index
 $\frac{3}{4}$ " Capacity



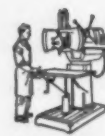
2BF Flange Mounted
Power Index
 $\frac{3}{4}$ " Capacity



2BH Automatic
Hydraulic
 $\frac{3}{4}$ " Capacity



3BH Automatic
Hydraulic
 $1\frac{1}{2}$ " Capacity



2BR Ram Type
Radial Drill
 $\frac{3}{4}$ " Capacity



2BHT-3BHT Automatic
Tape Controlled
 $\frac{3}{4}$ " and $1\frac{1}{2}$ " Capacity

✓ one man runs 2 machines!

tape controlled

Turret Drill

with automatic numerically controlled positioning table

At Clark Brothers Company, Olean, New York, one man runs two Burgmaster Electropoint Tape Controlled Turret Drills and reduces machining time on stop plate valve parts from 96 minutes to 26 minutes each, a savings of 75%. Important is the fact that the parts are produced in lots of fifty to two hundred, and expensive fixtures, costing approximately \$500 each and requiring drill bushings, are eliminated. A punched hole tape, which is made in three hours and can be stored and reused indefinitely, controls the machine to produce parts well within the .0025" tolerance required between holes. In addition, the operator has time to inspect the parts.

This actual case history is not unusual and it proves conclusively that both small and large plants producing from small lots to high production can use these Burgmaster Tape Controlled Turret Drills to advantage.

The Burgmaster Electropoint Control System can be applied to either the Model 2BHT—6 spindle or 3BHT—8 spindle Turret Drills, which are machines that are ideally suited for automatic tape control. The standard hydraulic Burgmaster controls are maintained, including pre-selective spindle speeds, infinitely variable pre-selective feeds, selective rapid approach and return, skip index-

ing, precision depth control, and simple manual controls for set-up. The Electropoint System automatically controls all machine functions, selects spindles in any sequence, automatically positions the table simultaneously on two axes, and clamps it in position while machining operations are being performed. All operations are carried out at their most efficient rate for high finish, precision, speed, and longest tool life.

Check into Burgmaster Electropoint Tape Controlled Turret Drilling, Tapping, and Boring Machines for your work. They can save you money from prototype to mass production work. There is a Burg direct representative or dealer near you. Call him—there is no obligation.

JOB FACTS:

Machine: Burgmaster Electropoint 2BHT—6 Spindle Turret Drilling, Tapping and Boring Machine.

Parts: Stop Plate and Seats for 8" Valve.

Material: .339 ductile iron.

Quantity: 50 to 200.

Holding: Self centering air vise, No Drill Bushings.

Accuracy: Holes $+0.003$ with $.0025"$ -0.0000
spacing, Dowel Hole $+0.015$ -0.0000

Tools: Special Carbide, Step Core Drill plus Finish Reamers, and H.S.S. Drills & Taps.

Program Part: 3 Hours each.

Set-up Time: 1.5 Hours each.

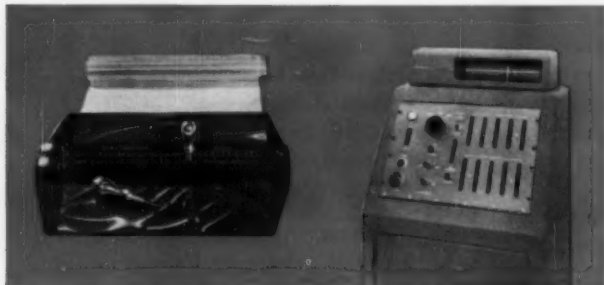
Former Method: Radial Drill using special fixtures with guide bushings.

Former Time: 96 Min. each.

Present Time: 26 Min. Floor to Floor, includes inspection each part.

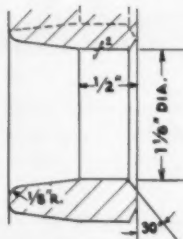
Savings: 75%, \$500 spec. fixture for each part.

Note: One Man runs two Machines.

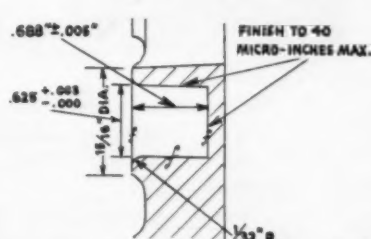


Tape Preparation is simple and Fast. Decimal dimensions and machining sequence data is punched directly into the tape (requiring no special training, codes, or computers) at an average rate of one minute per command block. Tape for this part, including 19 holes, programmed and punched ready for production in 3 hours. Punched tapes are tooling which can be stored and re-used indefinitely.

Machine Display—The display shows at all times the actual position of the table to three decimal places and the number of the operation being performed in the machining sequence. The display reads Table Positions $+0.0000$ to -0.0005 . The system provides "Manual Control," "Semi-Automatic Control," "Automatic Control," or Standard Burgmaster Automatic Hydraulic Control.



Operations, Part A. Special carbide step core drill is used for drilling 1-1/8" dia., C'Sinking 30° and finish ream for smooth machine finish—16 holes; 1-.125 dowel hole, drill 5/16" —tap 3/8—16 NC, 7/16 C drill x 1/2" deep, chamfer 45°.



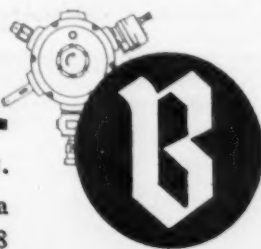
Operations, Part B. Special carbide step core drills to Bottom drill .625 dia. x .688 deep C'Sink 1/32" R., and Spot Face 15/16" dia. 1-16 holes; Holding 40 Micro Finish in Hole; 1-.125 dowel hole; 4-5/16" drill, 3/8" tap 16 NC, chamfer 45°.

Write for Bulletin describing Burgmaster 6 and 8 spindle Electropoint Tape Controlled Turret Drilling, Tapping, and Boring Machines. Describes how to program a part, make a punched tape, and put the job on the machine for automatic production. Thirty-minute 16mm sound film showing all Burgmaster Turret Drills in operation; available from any office without charge.

BURG TOOL

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FAculty 1-3510 DAVis 9-4158



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LONg Beach 1-1178

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ACademy 6-7030

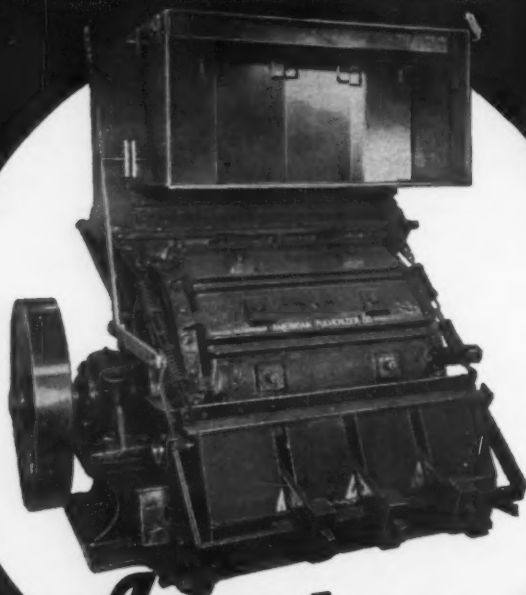
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CASH IN YOUR CHIPS

Change Metal Turnings Waste
into More Profitable Shoveling CHIPS



American
METAL TURNINGS
CRUSHERS

No progressive, profit-conscious company—who produces 10 or more tons of metal turnings per month—can afford to ignore the profit potential of a modern chip salvage system . . . with an American Metal Turnings Crusher at the core.

American installation profits include: \$4 more per ton for chips than for machine turnings; up to 50 gallons per ton in cutting oil recovery; 75% less storage; easier, faster handling.

How many profit dollars are you losing under present operations? If, for example, you're currently producing 20 tons of turnings a month . . .

THIS COULD BE YOUR PROFIT STORY FOR NEXT YEAR!

240 Tons Metal Turnings per Year (20 tons/month at \$4 extra per ton)	\$ 960.00
6,000 Gallons Recovered Cutting Oil at 30¢/Gal. (50 gals. per ton x 240 tons = 12,000 gals. Half of this, 6,000 gals., can be credited to use of chips instead of turnings in reclamation)	\$1,800.00
Estimated Savings in Manpower, Storage, Tools, Maintenance, Freight, etc.	\$ 300.00
TOTAL GROSS PROFIT	\$3,060.00



WRITE for Metal Turnings Crusher Bulletin.

1439 MACKLIND AVE. • ST. LOUIS 10, MO.

EXHIBITS, MEETINGS

(Continued from P. 13)

16, Manger Hotel, Cleveland. Society headquarters, P. O. Box 168, Cambridge, Mass.

Industrial Heating Equipment

Assn., Inc.—Spring meeting, May 18-21, The Homestead, Hot Springs, Va. Society headquarters, 1145 19th St., N. W., Washington, D. C.

American Electroplaters' Society—

Annual convention, May 18-22, Sheraton-Gibson Hotel, Cincinnati. Society headquarters, 6265 Wiehe Rd., Cincinnati.

Non-Ferrous Founders' Society—

Annual meeting, May 19-21, Carter Hotel, Cleveland. Society headquarters, 1604 Chicago Ave., Evanston, Ill.

Farm Equipment Institute—Spring

industry meeting, May 22, LaSalle Hotel, Chicago. Society headquarters, 608 S. Dearborn St., Chicago 5, Ill.

Air Pollution Control Assn.—An-

nual meeting, May 25-29, Sheraton Hotel, Philadelphia. Society headquarters, 4400 Fifth Ave., Pittsburgh 13.

JUNE

American Gear Manufacturers Assn.

—Annual meeting, June 1-4, The Homestead, Hot Springs, Va. Society headquarters, One Thomas Circle, Washington, D. C.

Institute of Appliance Manufac-

turers—Annual convention and exhibit, June 2-4, Netherland Hilton Hotel, Cincinnati. Society headquarters, Shoreham Hotel, Washington, D. C.

The American Nuclear Society—

Annual meeting, June 2-5, Statler Hotel, Los Angeles. Society headquarters, P. O. Box 963, Oak Ridge, Tenn.

Pressed Metal Institute—Manage-

ment meeting, June 4-5, Hotel Carter, Cleveland. Society headquarters, 3673 Lee Rd., Cleveland.

SCREW CORPORATION

reports

KEYSTONE *XL*

meets rigid aircraft industry standards



Flowability IS THE SECRET

How important can a fastener be? Ask the folks at Screw Corporation. They'll tell you that all fasteners used by the aircraft industry must be perfectly formed.

Screw Corporation serves 200 aircraft customers from their headquarters at 157 N. Rivergrade Road, City of Industry (Los Angeles).

For one major aircraft manufacturer, Screw Corporation has produced fasteners by the millions—all made from Keystone "XL" Wire... *flowability* is the secret and the reason why Keystone "XL" Wire is the preferred cold heading wire. See your Keystone Wire specialist soon or write direct.

Keystone Steel & Wire Company, Peoria 7, Illinois

KEYSTONE

WIRE FOR INDUSTRY

Here's Keystone "XL" flowability in action. Extremely close tolerances were required for this Phillips head sealing screw. The uniform head for flush mounting and the accurately formed groove to hold the sealing ring must be precise.



A difficult Phillips recess—a small #6 round head with a #2 Phillips recess. The head diameter is out of proportion to recess diameter—a production reality when Keystone "XL" Wire is used.



Keystone "XL" Wire's flowability allows straight sides and sharp corners in heading of this Fillister head screw. Shaving operation was eliminated.



This fastener is the base for one of the newer developments in electronics—the transistor. Screw Corporation reported this to be a difficult forming job—but the problem was solved with Keystone "XL" Wire.



These fasteners are magnetically inspected to insure no fractures before assembly. Keystone "XL" Wire passes this test daily on these flush fasteners which, with "O" rings, seal aircraft interiors so they can be pressurized.



Keystone Steel & Wire Company
Peoria 7, Illinois

Brand New... COLD HEADING FACTS FOLDER... send coupon today! New folder discusses uses, applications, methods, technical facts, wire requirements.

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PIPE AND TUBE MILLS (ferrous or non-ferrous)

ROTARY SLITTING LINES

Announcing

A NEW CONCEPT IN ELECTRIC HOISTS

The COFFING Quik Lift

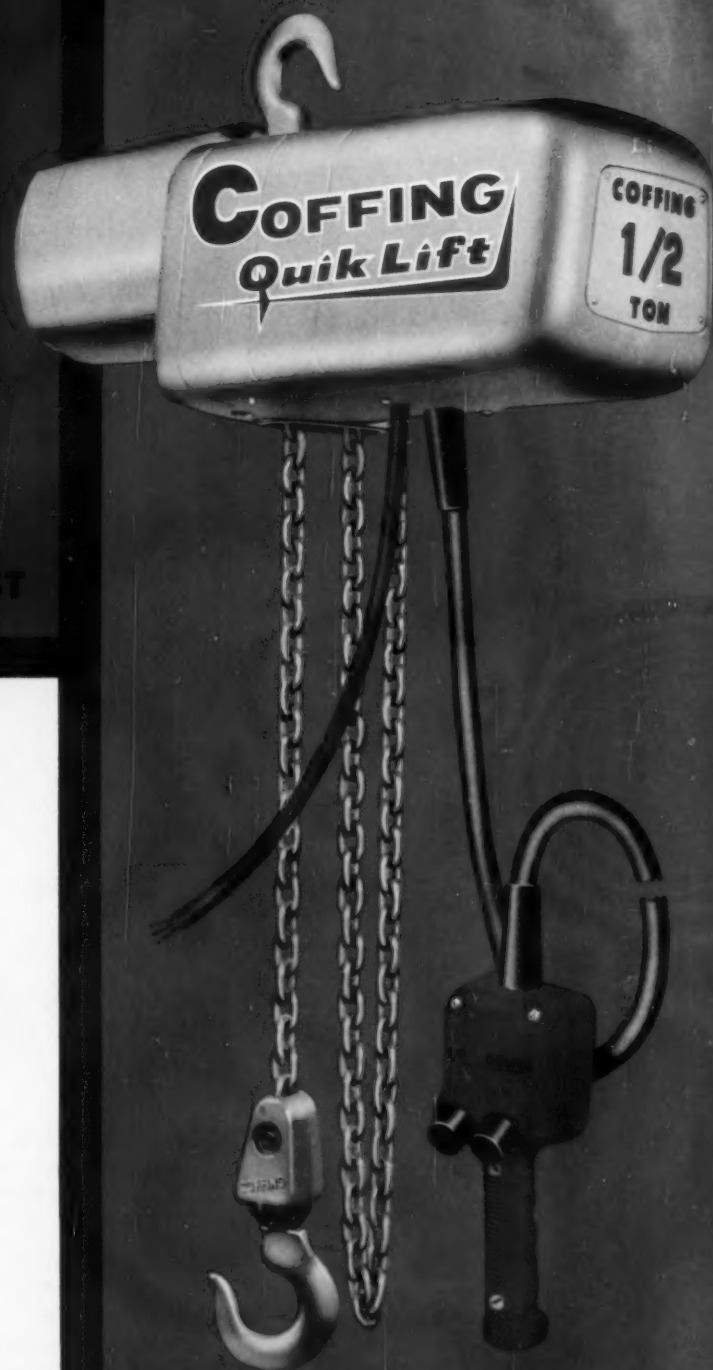
COIL CHAIN ELECTRIC HOIST

Durability with portability has been achieved in the completely new Coffing Quik-Lift electric hoist. The design incorporates the latest advances in metallurgy and metal forming to obtain strong parts which are lightweight.

The die cast aluminum alloy housing is in sections to give quick, easy access to all parts. Changing voltages, type of suspension, or chain is accomplished quickly and easily, so that moving the Quik-Lift from station to station in the plant is a simple operation.

Push-button controls are mechanically interlocked, and the non-conducting plastic station is shaped as a hand grip for pulling the hoist—the control line incorporates a strain cable. For additional safety, control circuits are 115 volts regardless of hoist voltage.

Take advantage of Coffing's new concept of complete flexibility for electric hoists. Your Coffing distributor will be glad to give you complete details, or we will send you the twelve-page Bulletin ADH-65.



- Capacities 1/4 to 2 Tons
- Interlocked Push-Button Controls
- Lightweight for Easy Portability
- Convenient Operation
- Accessibility



COFFING HOIST

DIVISION OF DUFF-NORTON COMPANY

800 Walter Street • Danville, Illinois



THERE ARE SCORES OF VANCORAM ALLOYS. They come in drums, pallet boxes, container cars, and in bulk. When quantity justifies, most VCA products are available in barge shipments. But no matter which ones you use . . . or the form in which you use them . . . they always contain two basic and unvarying ingredients:

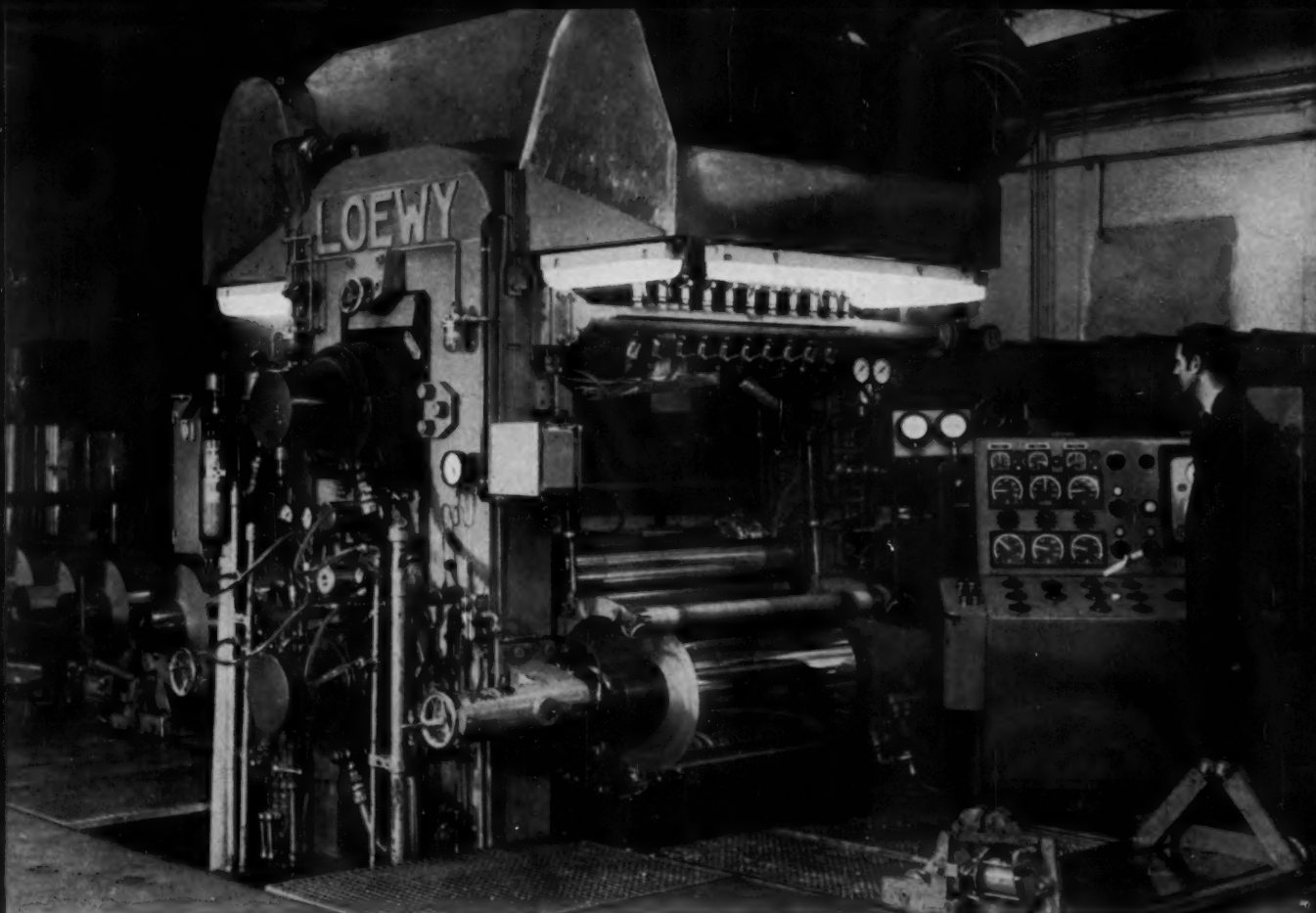
Uniformity, and a high level of quality you can count on. We know this because we control the quality from mine to finished product. We apply over fifty years of alloy-making experience to the task of delivering to you the products that will do your job best, at lowest cost. Furthermore, we back every Vancoram product with a brand of service that matches the high quality of that product.

Vancoram — the first name in alloys, the last word in quality! Next time you need alloys, or help in solving ferro alloy problems, be sure to call your nearest VCA Office or distributor. Remember: they are there to serve you! Vanadium Corporation of America, 420 Lexington Avenue, New York 17, N. Y.

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**VANADIUM
CORPORATION
OF AMERICA**



A Loewy Hydromil foil mill installation 10 in. x 22 in. x 48 in. at Aluminiumwerke AG, Rorschach, Switzerland. View is from windup side and shows operator's pulpit and hydraulically operated coil cars in front of and behind the mill.

Top quality .00035 foil at top speeds... on Loewy HYDROMILS

Four years ago Loewy-Hydropress created the first Hydromil.[®] Today there are 20 installations in the United States, Canada, France, Switzerland and Japan attesting to the swift and widespread recognition of the Hydromil.

Hydromils are outstanding. They offer all the features essential to the production of finest quality foil: proper rolling speed and temperature, contamination-free coolant circulation, rapid roll change, rigidity, constant front and back tension, safety devices for off-gage material, and—most important—continuous hydraulic

roll pressure control. Visual indicators of speed, pressure, tension, temperature and foil thickness make it easy to supervise the operation from the control pulpit.

While most conventional foil mills are merely strip mills modified to turn out foil, Loewy Hydromils are foil mills in every sense of the word, conceived in all details for the economical high-speed production of the thinnest, widest and most uniform product. Depending on the output required, Loewy furnishes Hydromils as single mills or in groups of two or three. For complete information, write Dept. A-5.



Hydromil shown from payoff side. A unique feature is the patented under-the-mill transfer of empty spools from payoff to windup side. Both photos courtesy Aluminiumwerke AG, Rorschach.

Loewy-Hydropress Division
BALDWIN · LIMA · HAMILTON

111 FIFTH AVENUE, NEW YORK 3, N.Y. Rolling mills • Hydraulic machinery • Industrial engineering





At left: William Warman, Garry Manufacturing Company screw machine department foreman, shows Gulf representative Jacques Schindler one of the precision contacts being turned out in huge quantities with the aid of Gulfcut Heavy Duty Soluble Oil. The lubricating-cooling-protective properties of this new soluble cutting oil are unmatched.



To eliminate "stock jam" in screw machines Garry Manufacturing Company turned to GULFCUT HEAVY DUTY SOLUBLE OIL

Garry Manufacturing Company, New Brunswick, N. J., is one of the country's largest producers of precision Swiss screw machine parts for the electronics and instrument industries.

Before switching to Gulfcut Heavy Duty Soluble Oil, Garry had trouble with stock jamming in their screw machines, in the manufacture of $\frac{1}{8}$ " diameter leaded copper pin contacts. Their former oil didn't have adequate cooling ability to prevent copper expansion when the stock fed through a small-clearance slot.

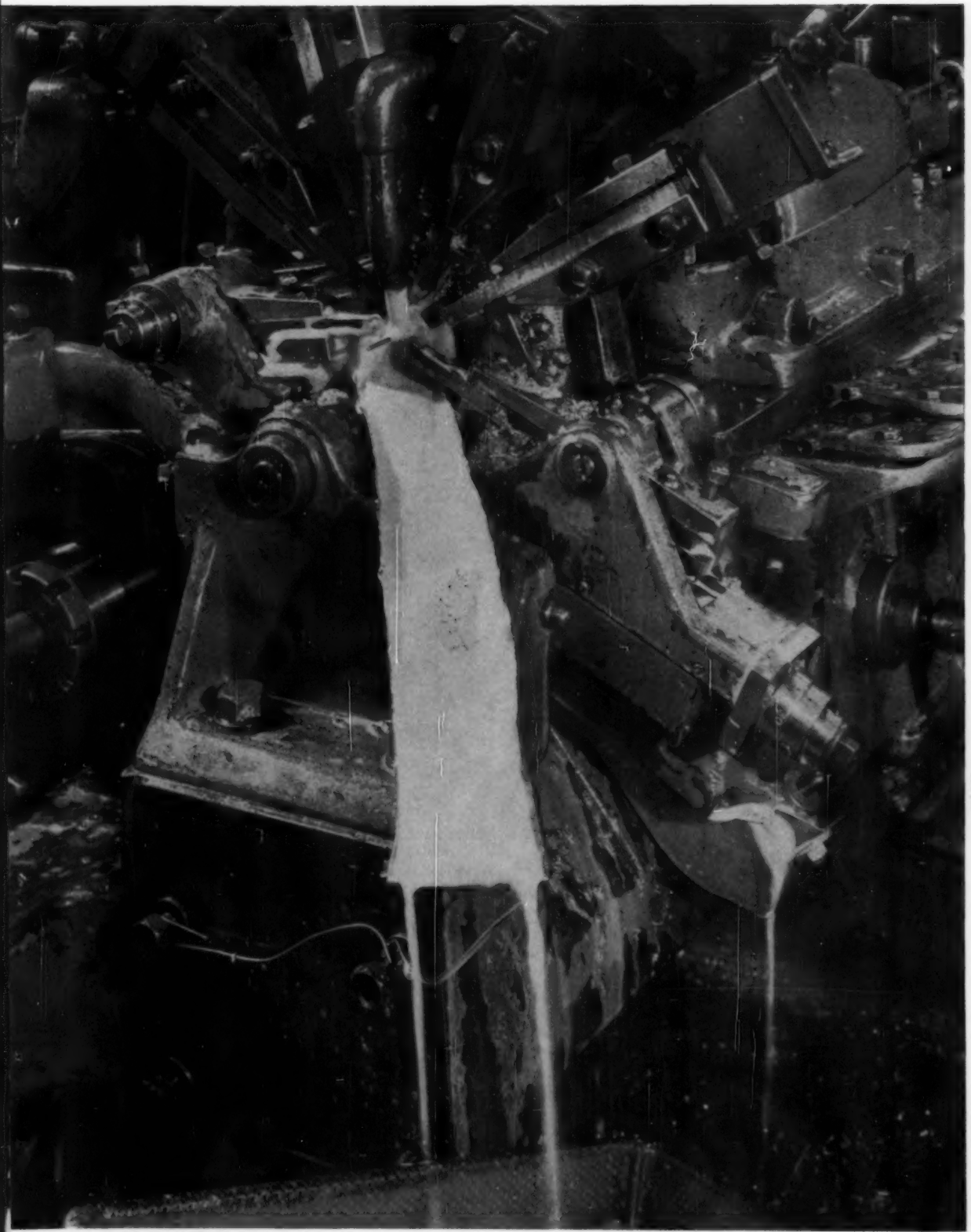
Gulfcut Heavy Duty Soluble Oil stopped this jamming. Now there are fewer shutdowns, production is greater and tolerances are held to .0002". Garry gets finer finishes, too—better than 16 microns—and longer tool life.

Garry uses a 1 to 10 emulsion. In other plants, Gulfcut Heavy Duty Soluble Oil has been effective even when mixed 1 to 150 with water! It won't separate or gum, contains a potent rust inhibitor, has excellent emulsion stability. It has high surface-wetting properties, is anti-weld, anti-wear, anti-foam. It permits higher speeds, deeper cuts—and its applications include heavy hogging cuts, fast fine cuts, boring and grinding of ferrous materials, tough alloys and soft, non-ferrous metals.

Gulfcut Heavy Duty Soluble Oil is only one of many Gulfcut oils, each scientifically compounded to do specific machining jobs. There's one for every job in your shop. For more information, just call your Gulf Sales Engineer, at the nearest Gulf office, or write for illustrated bulletin.

GULF OIL CORPORATION • Dept. DM, Gulf Building, Pittsburgh 30, Pa.





Special screw machines at Garry Manufacturing Company, New Brunswick, N. J., operate at 10,500 rpm turning out pin contacts. Tolerances are held to .0002" with the aid of Gulfcut Heavy Duty Soluble. This fine oil gives finer finishes, longer tool life and greater protection against corrosion.

AVOID RISK If you buy steel...

USE OUR CAPITAL to cut your inventory costs

You save money when you use the steel inventory of your Steel Service Center. Cutting down your steel stocks frees your capital for more profitable use . . . ties up less working capital. That's good business.

You can save space, and the cost of that space by using our inventories as your own. You seldom suffer obsolescence losses. You avoid inventory problems created by too-ambitious forecasts.

We deliver your steel when you want it, cut to exact size, and ready for your use. Whatever your steel need, there's

a nearby Steel Service Center set up to serve you quickly from stock.

If you're putting steel in inventory because you think it's a bargain, compare all of your costs of possession with the cost and freedom-from-risk of buying steel from your Steel Service Center.

Or, to be more precise, get the booklet *What's Your Real Cost of Possession for Steel* from your convenient Steel Service Center. American Steel Warehouse Association, Inc., 540 Terminal Tower, Cleveland 13, Ohio.



The American Steel Warehouse
...YOUR STEEL SERVICE CENTER

COST OF POSSESSION FOR STEEL IN YOUR INVENTORY

Per ton delivered	_____
Cost of capital:	
Inventory	_____
Space	_____
Equipment	_____
Cost of operation:	
Space	_____
Materials handling	_____
Cutting & burning	_____
Scrap & wastage	_____
Obsolescence	_____
Insurance	_____
Taxes	_____
TOTAL	_____

COST OF FREEDOM-FROM-RISK STEEL FROM YOUR STEEL SERVICE CENTER

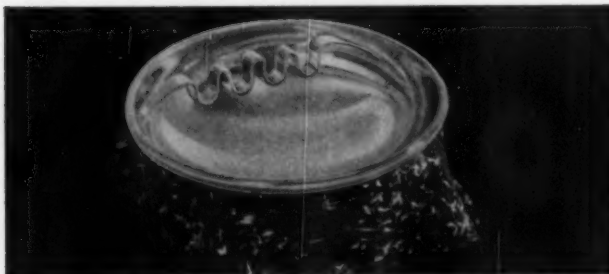
Per ton, cut-to-size, and delivered	_____
TOTAL	_____

NEW BRASS SPEEDS FINISHING

operations for Park Sherman Co.—Formbrite, Superfine-Grain Drawing Brass by Anaconda, reduces polishing time—cuts cost up to 50%—gives clean, easy formability.



TO THE PARK SHERMAN CO., Springfield, Ill., finishing operations are important in giving its line of fine brassware sales appeal—are also weighty cost factors. Switching from ordinary drawing brass to Formbrite, Park Sherman boosted production on the tray of this "Merry-Go-Round" Bar—25% in the cutting operation—42% in finish buff.



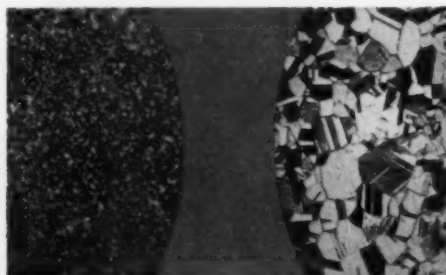
PRODUCTION INCREASED 47% in finishing operations on this Park Sherman Sta-Put ashtray after the shift to Formbrite. Products shown are only three of many Park Sherman products now made of Formbrite.

Wherever finishing is an important cost factor in formed or drawn products, Formbrite in sheet and strip is designed to save you money. In brass wire alloys for cold-heading and upsetting, it gives a stronger, springier, more abrasion-resistant product. For more detailed information, write for Publication B-39. Address: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

0548



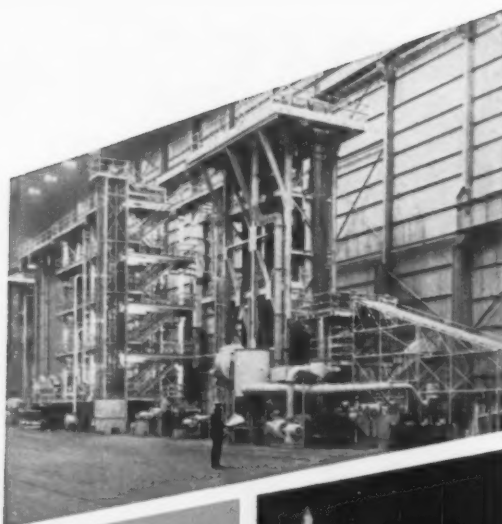
THE COVER of this Park Sherman Silent Butler is now made of Formbrite, Anaconda's Superfine-Grain Drawing Brass. Polishing operations in preparation for chromium plating are 50% faster than with ordinary drawing brass.



THE SECRET of Formbrite's superior polishing characteristics is its superfine-grain. Micrographs (75X): left, Formbrite; right, ordinary drawing brass.

FORMBRITE®
SUPERFINE-GRAIN DRAWING BRASS
a product of
ANACONDA®

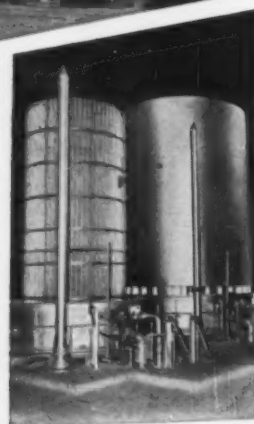
Made by The American Brass Company



VERTICAL STRIP ANNEALER



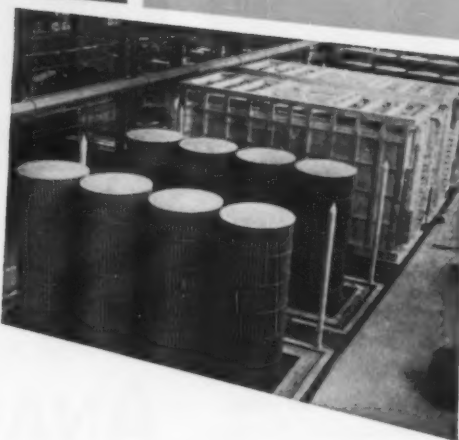
SINGLE-STAND ANNEALERS



CONTINUOUS STRIP GALVANIZER



MULTIPLE-STAND ANNEALERS



foundation for steel mill profits

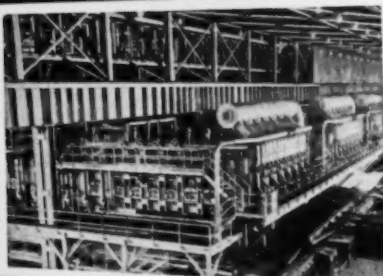
CARBOTTOM COVER FURNACE



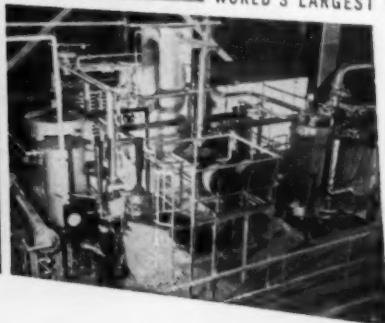
ONE-WAY FIRED SOAKING PITS



WORLD'S LARGEST SLAB HEATER



HXX GAS GENERATOR



You put a solid foundation under your profits whenever you specify Surface equipment. Whatever type it may be, you know it is supported by many interlocked blocks of know-how in heating and handling steel.

The technical skills which Surface has developed in building soaking pits will benefit the man who buys Surface annealing covers. In the same way, Surface concepts of slab heating contribute to high-speed stress relieving . . . carbon restoration to strip annealing . . . controlled atmospheres to wire patenting.

Because of this broad and deep foundation of experience, Surface can improve any single process in the context of a complete sequence of operations. This is to the customer's profit, as many companies will confirm.

Surface Combustion Corporation, 2402 Dorr St., Toledo 1, Ohio. In Canada: Surface Industrial Furnaces, Ltd., Toronto, Ontario.



wherever heat is used in industry

ASSOCIATED COMPANIES: British Furnaces, Ltd., Chesterfield • Stein & Atkinson, Ltd., London • Stein & Roubaix, Paris • S. A. Belge, Stein & Roubaix, Bressoux, Liège • S. A. Forni Stein, Genoa • Chugai Ro Kogyo Kaisha, Ltd., Osaka • Benno Schilde Maschinenbau, A. G., Bad Hersfeld



This man is tabling downtime indefinitely with SKF's new steel pillow blocks

He's cutting bearing maintenance to a minimum yet drastically reducing the chances of table downtime! For he's equipping the mill tables with SKF's new SMT Steel Pillow Blocks with self-aligning spherical roller bearings.

The split construction design of these new pillow blocks makes it possible for rolls to be removed without disturbing base alignment. The non-rubbing, labyrinth-type seal effectively keeps out scale and water and is not affected by high temperatures.

The Type "C" Spherical Roller Bearing gives him the highest capacity available in any self-aligning roller bearing. This high capacity is available despite angular

misalignment caused by heat warpage of the table structure or other factors promoting table misalignment.

He'll save with direct, center lubrication, too . . . because a lubricating groove is provided around the circumference of the outer ring of SKF sphericals with equally spaced holes drilled in the ring connecting the groove to the center of the bearing. Grease moves around the groove and through the holes which channel it directly to the center of the bearing.

Why not make the change-over to SKF Steel Pillow Blocks yourself? Write for Catalog #447.



7821



Spherical, Cylindrical, Ball, and *Tyson* Tapered Roller Bearings

EVERY TYPE—EVERY USE

SKF®

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

* REG. U. S. PAT. OFF.

SIMONDS

**gives you
the right Blade
...for every
Duel with Costs**



Power and hand hack-saw cutting are most efficient . . . and cost less . . . when the blade wears the Simonds "Red End". Here's why:

Accurately milled and precision-set teeth wear evenly, provide straighter cuts and longer blade life. Simonds own cross-rolled steel has more uniform grain structure with added toughness to resist wear and give more cuts per blade. Put these better blades to work for you NOW . . . get better results at lower cost!

SIMONDS

"RED END" POWER BLADES

3 Types — All Standard Lengths and Tooth Spacings

- **HIGH SPEED MOLYBDENUM**
- **HIGH SPEED TUNGSTEN**
- **HIGH SPEED "WELD EDGE"**

(Shatterproof)

For general purpose cutting, Simonds High Speed MOLYBDENUM cuts fast and straight at lowest cost. For cutting high alloys (and maximum performance) Simonds High Speed TUNGSTEN is recommended. For maximum plant safety Simonds "WELD-EDGE" is the choice — won't snap despite abuse and poor machine condition or adjustment. Pick the blade (or blades) you need, but make it *Simonds*!

SIMONDS

"RED END" HAND HACKSAW BLADES

3 Types — Hard Edge or All-Hard
Standard Lengths and Tooth Sizes

- **STANDARD STEEL** • **HIGH SPEED MOLYBDENUM**
- **HIGH SPEED TUNGSTEN**

Again . . . pick the blade for the job. Hard Edge (blade-body tough and highly strain resistant) is best for general purpose cutting. All-Hard for quality cutting where work is securely held. "Pick your teeth" also for the job — 14 teeth for soft metals; 18 for cutting tool steels, iron pipe, etc.; 24 for drill rod, tubing, etc.; 32 for thin sheet and thin tubing.

LOOK for . . .
INSIST on . . . the
blade with the
"RED END"

For Fast Service
from
Complete Stocks
Call your



SIMONDS
Industrial Supply
DISTRIBUTOR



SIMONDS
SAW AND STEEL CO.

FITCHBURG, MASS.

Factory Branches in Boston, Chicago, Shreveport, La., San Francisco and Portland, Oregon, Canadian Factory in Montreal, Que., Simonds Divisions: Simonds Steel Mill, Lockport, N. Y., Heller Tool Co., Newcomerstown, Ohio, Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada

ANOTHER IN A SERIES
OF MOTOR FACTS
FROM ALL INDUSTRIES



Westinghouse motors double normal life for this application

... at Ohio-Apex Div., Food Machinery
and Chemical Corp.

this standard **Life-Line A** motor
still pumping corrosive POC I, after 12 continuous months
without maintenance or down time

"We must have a dependable motor, completely sealed and corrosion-resistant," says Mr. Burton Fitch, Ohio-Apex Division of Food Machinery and Chemical Corporation, Nitro, West Virginia. "A corrosive atmosphere, plus phosphorous oxy-chloride drip and seepage, cuts motor life. Westinghouse Life-Line® "A" motors have already passed this replacement point twice ... and are still going strong."

Westinghouse motors last longer because they're designed for modern industry's needs. For more facts about the Life-Line "A," call your local Westinghouse representative ... or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

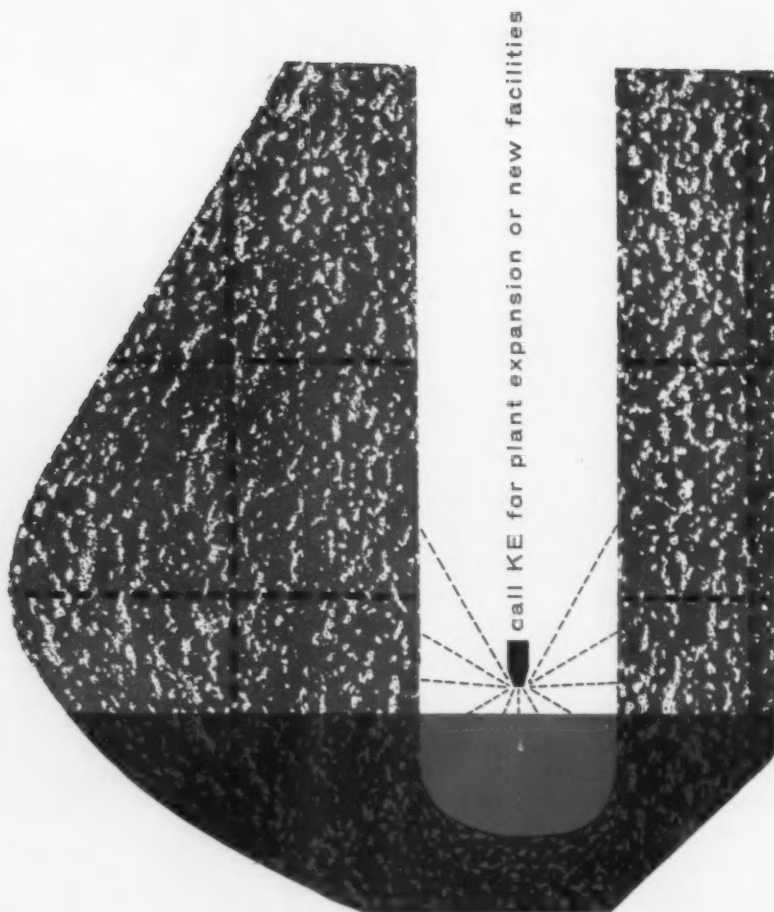
J-22034-R

YOU CAN BE SURE...IF IT'S Westinghouse

←
Unretouched photo of Life-Line "A" three-hp motor
driving chemical pump at 1730 rpm, 100 gpm at
Ohio-Apex.

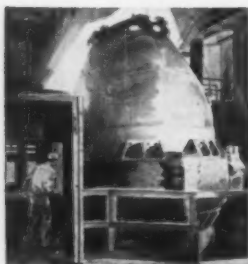
"Westinghouse Life-Line "A" motors have cut our motor costs substantially ... helped us keep our chemicals moving down the line," says Mr. Fitch of Ohio-Apex. "Their built-in ruggedness, plus fool-proof sealing against corrosion, means longer life, lower maintenance."





INGENUITY

has made KE the experienced leader in L-D Process Steel



L-D process plant similar to that installed by KE at a major eastern steel plant.

Design and construction of over 2,000,000 tons of oxygen steel making capacity. Intimate familiarity with oxygen steel technology in all parts of the world. A pioneer's experience in applying tested techniques of steel making. U.S. licensor for the proven L-D process—also P.T. Oxygen Guns for present and planned open hearths.

These are reasons why Kaiser Engineers is uniquely qualified to develop your oxygen steel program. Another reason is traditional KE ingenuity—engineering and construction ingenuity which means your steel facilities will be completed more quickly, at lower cost, and operate more efficiently.

Economic analysis, plant location, engineering, design, procurement, expediting, construction—KE does one or all. With your first thought of new steel producing facilities—call KE.



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4981



THE "BUFFALO" UNIVERSAL IRON WORKER

NOTCHES

PUNCHES

SHEARS

MITERS

SLITS CUTS COPEs

**takes the space of one machine,
does the work of six — FAST!**

The compact, multi-purpose "Buffalo" Universal Iron Worker saves space, time and work. It occupies the space of only *one* machine, yet performs up to *six* operations. The UIW will handle up to three jobs *at once*, thus saving much labor and time in conveying work.

The versatile "Buffalo" Universal Iron Worker is available in several models for cutting, punching, notching, shearing, slitting, coping, mitering — without changing tools. It quickly and easily handles angles, tees, channels, bars and flats.

The heavy electrically-welded steel plate frame, rugged construction throughout and one-shot lubrication system insure a long life of efficient, dependable service. Easy to set-up, easy to operate, the "Buffalo" Universal Iron Worker will speed up production and maintenance in your shop as it has in hundreds of others.

Contact your "Buffalo" machine tool dealer for a demonstration of the UIW — see how it can streamline *your* shop operations. Or, write for Bulletin 360-G for full details.

Every "Buffalo" product brings you the extra "Q" Factor value-bonus — the built-in QUALITY that provides trouble-free satisfaction and long life.



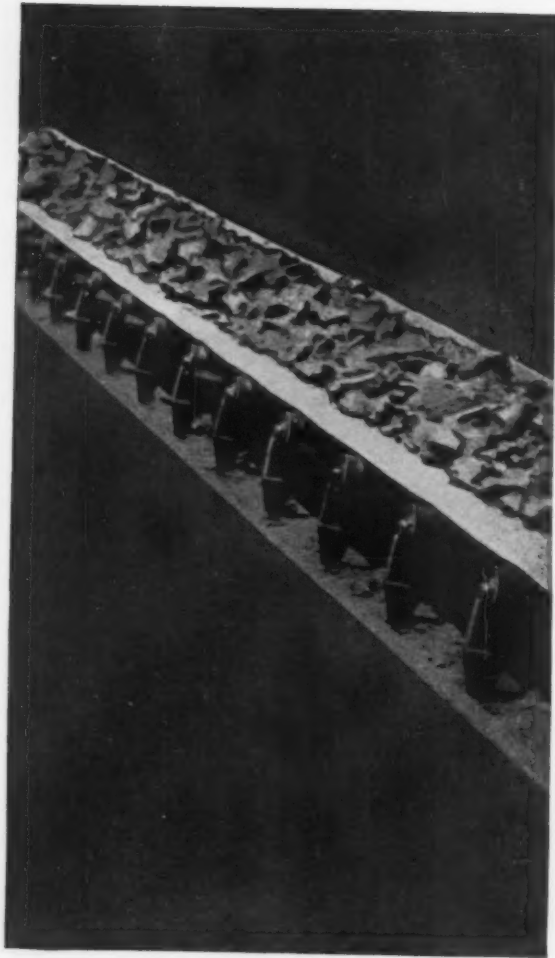
BUFFALO FORGE COMPANY

492 BROADWAY • BUFFALO, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

**DRILLING
PUNCHING
SHEARING
BENDING**

WHY BUY



ONLY 2/3 OF A BELT?

...it's the Last Third of an
R/M Conveyor Belt that Gives

for your
"More Use ~~per~~ Dollar"



It's the *last* one-third of conveyor belt life that determines its final cost. Real conveyor belt cost is the cost per foot of belt in terms of load carrying capacity for the *potential service life of the belt*. R/M's new conveyor belt construction now assures you $\frac{1}{3}$ longer belt life! Here's why:

R/M engineers recognize that every belt feature—troughability, resiliency, fastener holding ability, strength member fabric, cover toughness and thickness—help determine the true cost of Ray-Man Conveyor Belt on your job. And that's why every Ray-Man component is precision proportioned to assure better belt balance where it pays off most for you—in longer belt service life!

Let an R/M representative show you how *extra* life in the last $\frac{1}{3}$ of conveyor belt service means "More Use per Dollar" with Ray-Man Conveyor Belt and other R/M heavy duty constructions.

RAY-MAN CONVEYOR BELT

- Trains Naturally
- Resists Impact and Ripping
- Double Compensation Relieves Outer-Ply Stress
- Holds Fasteners
- Requires No Breaker Ply
- Exclusive "XDC" Long-Wear Cover
- Moisture Resistant, Mildew-Proof

RM012

BELTS • HOSE • ROLL COVERINGS • TANK LININGS • INDUSTRIAL RUBBER SPECIALTIES

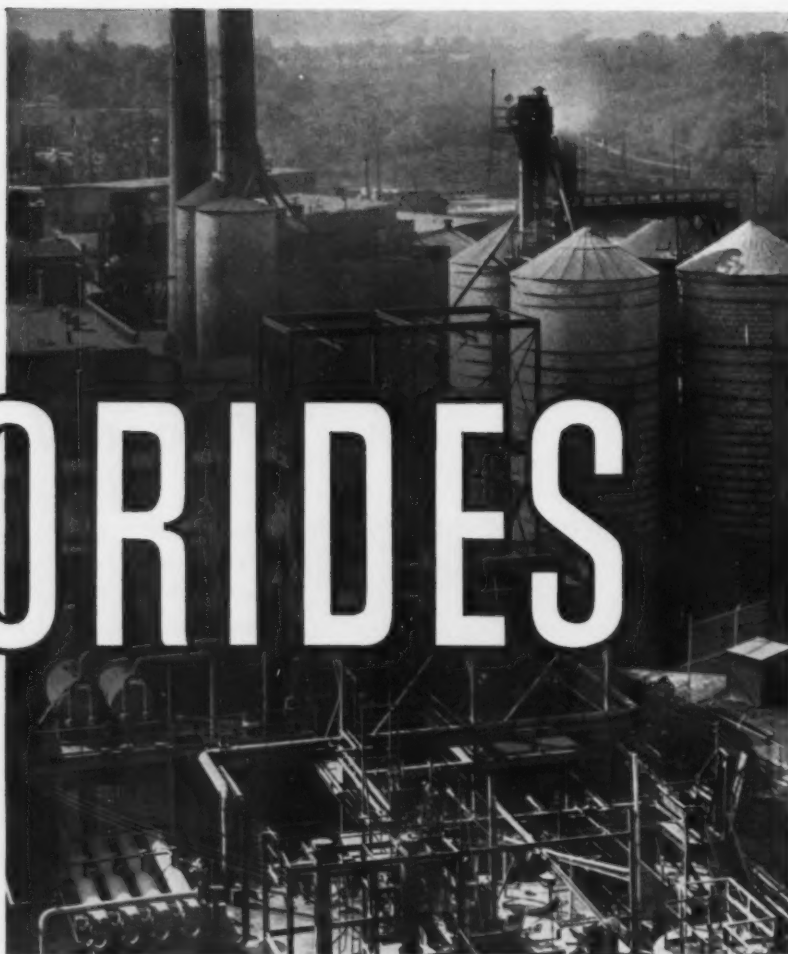
MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY
RAYBESTOS-MANHATTAN, INC.

Other R/M products: Abrasive and Diamond Wheels • Brake Blocks and Linings • Clutch Facings • Asbestos Textiles • Mechanical Packings • Engineered Plastics • Sintered Metal Products • Industrial Adhesives • Laundry Pads and Covers • Bowling Balls



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manufactured
in one of the
largest facilities
in the world



Unloading mineral fluospar which comes to us from various parts of the world.

Write for your free copy of M.C.A. Chemical Safety Data Sheet SD-25 on properties and essential information about HYDROFLUORIC ACID Anhydrous and Aqueous.



BORON TRIFLUORIDE HYDROFLUORIC ACID ANHYDROUS...AQUEOUS

and a long list of other
production-controlled high-quality fluorides

Ammonium Bifluoride	Hydrofluoric Acid Aqueous
Ammonium Fluoborate	Hydrofluosilicic Acid
Antimony Trifluoride Sublimed	Lead Fluoborate
Barium Fluoride	Metallic Fluoborates
Bismuth Fluoride	Nickel Fluoborate
Boron Trifluoride	Potassium Bifluoride
Boron Trifluoride Complexes	Potassium Chromium Fluoride
Cadmium Fluoborate	Potassium Fluoborate
Chromium Fluoride	Potassium Fluoride
Copper Fluoborate	Potassium Titanium Fluoride
Fluoboric Acid	Silico Fluorides
Fluorine Cells	Sodium Fluoborate
Fluorinating Agents	Tin Fluoborate
Frosting Mixtures	Zinc Fluoborate
Hydrofluoric Acid Anhydrous	Zinc Fluoride

If required you are invited to draw on the knowledge and experience of our staff of technical specialists on fluorides.

The Harshaw Chemical Company

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HASTINGS-ON-HUDSON, N. Y. • PHILADELPHIA • PITTSBURGH



Here the Multi-Strand is producing three $3\frac{1}{4}$ " O.D. x .350 copper tubes down to $1\frac{1}{2}$ " O.D. x .080.
The machine can be used for copper, brass, aluminum or steel tubes.

MULTI-STRAND COLD TUBE ROLLING MILL

"Great Advancement for Economical Production
of Small Diameter Tubing"

This is a breakdown process — producing a copper tube $1\frac{1}{2}$ " O.D. direct from a pierced or extruded shell 3 inches in diameter.

The production, considering the heavy reduction of 90%, is equivalent to five cold draw passes and the full production of two triple drawbenches (one 150,000 lbs., one 100,000 lbs.). The rolling method eliminates pointing of tubes, sawing and crane handling. The tubes, without annealing, can go directly to a Bull Block or Drawbench for final reduction.

This revolutionary method, developed by Aetna-Standard, results in a new economical way of producing small diameter tubing. The initial installation is producing tubes in quantity beyond original expectations.

- Much less handling.
- Heavy reductions on three tubes at a time.
- A ten-to-one elongation.
- Saves man-hours, floor space and tube handling.


AETNA • STANDARD

THE AETNA - STANDARD ENGINEERING COMPANY

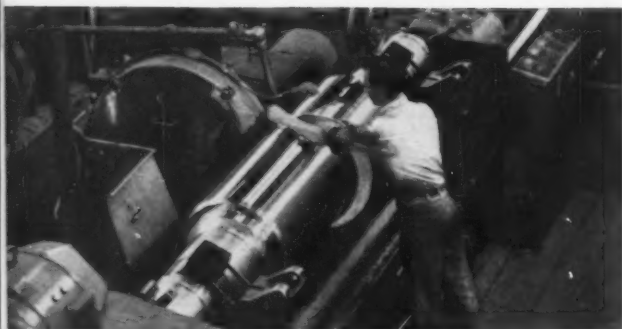
GENERAL OFFICES: PITTSBURGH, PA. • PLANTS: ELLWOOD CITY, PA., WARREN, OHIO • RESEARCH LABORATORY: AKRON, OHIO

CONTINUOUS GALVANIZING LINES • CONTINUOUS ANNEALING LINES • CONTINUOUS ELECTROLYTIC TINNING LINES • SIDE TRIMMING AND SHEAR LINES AND OTHER FINISHING EQUIPMENT • CONTINUOUS BUTT WELD PIPE MILLS • SEAMLESS TUBE MILLS • DRAWBENCHES AND OTHER COLD DRAW EQUIPMENT • ROLLS AND CASTINGS • EXTRUDERS, MILLS, PRESSES FOR RUBBER, PLASTIC AND CHEMICAL

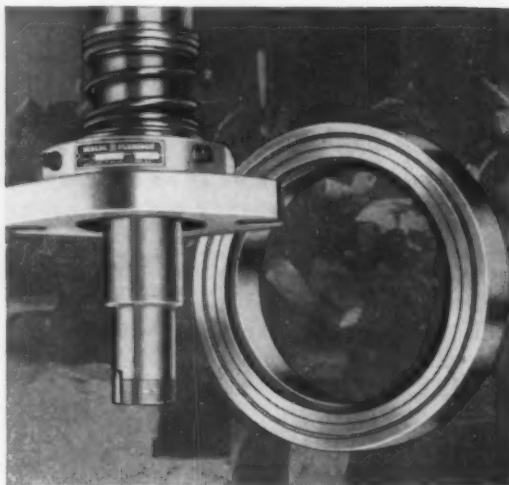
PROOF OF QUALITY



REPUBLIC COLD DRAWN CARBON BARS are used in the manufacture of Shotgun Barrels by Harrington and Richardson, Inc. Mr. Arthur F. Hird, Chief Engineer, states his reasons in a letter reproduced on the opposite page. For information on how Republic Cold Finished Steel may help solve your manufacturing problems, contact your local Republic office or mail coupon.



CHATEAUGAY PIG IRON QUALITY IS PROVED time after time by the superior results achieved in producing giant mill rolls. One such roll is shown being finished to an extremely smooth surface. Other requirements include high strength, wear and heat resistance, and ease of machinability. Chateaugay, Republic's exclusive pig iron fills the bill perfectly. For details on low phosphorus, copper-free Chateaugay, mail coupon.



A LATHE FINISH OF GROUND SURFACE QUALITY is reported by Seal Corporation, Providence, Rhode Island, in the production of mechanical shaft seals using Republic Free-Machining ENDURO[®] Stainless Steel Bars. In addition, ENDURO's excellent physical properties overcome shaft wear and attack by corrosive elements. Republic can furnish ENDURO in a complete range of analyses, in the best form to meet your needs. Send coupon for data.



HIGH QUALITY IRON POWDER PARTS are easier to produce using Republic CDF Iron Powders. CDF means Controlled Dimensional Factor in three types of powders—Type "G" for growth, Type "N" for normal (no dimensional change), and Type "S" for shrinkage after sintering. Send coupon for booklet ADV-763 containing full information on test evaluations, chemical composition, and physical properties of Republic CDF Iron Powders.

HARRINGTON & RICHARDSON, INC.

MANUFACTURERS

Since 1871

Fire Arms

H&R ARMS CO., LTD. MONTREAL, CANADA

WORCESTER 10
MASSACHUSETTS
U.S.A.

January 1958

PLEASANT 7-8341
CABLE ADDRESS HARRICH

Republic Steel Corporation
Republic Building
Cleveland 15, Ohio

Gentlemen:

Ever since Harrington & Richardson, Inc., manufacturers of all types of small arms, was organized in 1871, their Metallurgists and Engineers have been experimenting to find the most suitable material for the manufacture of Shotgun Barrels. The steel required had to be of uniform structure and high quality with physical and dimensional stability. It also had to be well suited for machining at higher feeds and speeds, effect longer tool life, produce better surface finish, and provide the higher ultimate strength required by today's high pressure, smokeless powder ammunition.

Manufacturers of Gun Barrels are all too familiar with the specific problems involved. Operations such as Deep-Hole Drilling, Deep-Hole Reaming, Deep-Hole Bore-Burnishing, and Long-Length Turning operations as affecting polishing can make or break a process if such operations are beset by material problems causing high operational costs and excessive rejects.

Republic Cold Drawn Carbon Bars are the answer to the problem. For the past five years Harrington & Richardson, Inc. has been using one and three-sixteenth diameter, cold finished, magnetic tested, stress relieved bars with a maximum of success.

Harrington & Richardson, Inc. has found that the uniformity of structure eliminates hard spots in machining - the bugaboo of surface finish - and produces a barrel of uniform strength capable of withstanding great forces.

The quality of the steel is reflected in the surface finish achieved. Republic Cold Drawn Carbon Bars are relatively free of sub-surface defects and incipient cracks appearing at the final turning and burnish "bore buttoning" operations. Its physical and dimensional stability reduces the need for constant machine adjustments and straightening operations. All of these characteristics combine to reduce rejects to an absolute minimum effecting low operational and material costs.

Republic Steel Corporation can indeed be proud that this material enables Harrington & Richardson, Inc. to offer higher quality firearms to sportsmen at very moderate prices.

Very truly yours,

Arthur F. Hird

Arthur F. Hird
Chief Engineer

AFH:em

ALL AGREEMENTS ARE CONTINGENT UPON STRIKES, ACCIDENTS AND OTHER DELAYS UNAVOIDABLE OR BEYOND OUR CONTROL.

REPUBLIC STEEL



*World's Widest Range
of Standard Steels and
Steel Products*

REPUBLIC STEEL CORPORATION

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Please send more information on:

- ☐ Cold Finished Steel Bars ☐ ENDURO Stainless Steel
☐ Chateaugay Pig Iron
☐ Please send Booklet ADV-763 on Republic CDF Iron Powders

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

**Where a misstep costs \$500...
Blaw-Knox Electroforged® Steel Grating
provides safer non-slip footing**



*Stair falls cost industry
over \$60,000,000 a year.*

An average accident amounts to a loss of \$500 in claims and a loss of 320 days.*

A good way to guard against these profit-eating accidents is to construct your stair treads, walkways and floors with Blaw-Knox Electroforged Steel Grating. Non-slip twisted crossbars and a wide variety of bearing bars are available to meet every kind of working condition—safely solving the most hazardous skid situations.

Rigid, one-piece construction makes installation easy. Once on the job, Blaw-Knox grating practically takes care of itself. There is nothing to wear, nothing to patch, no dirt collecting corners to clean. It goes anywhere, fitting neatly around pipes, beams and machinery, admitting plenty of light and air to the area.

Made to your specifications, Blaw-Knox grating provides new highs in safety, easy up-keep and flexible application. For new ideas about grating—including space saving platforms and shelving, write for Bulletin 2486.

*Based on a study analyzing 803 compensable work injury claims closed in Illinois involving stairs and steps.

BLAW-KNOX

BLAW-KNOX COMPANY

*Equipment Division
Dept. T, Pittsburgh 38, Pennsylvania*

FOR LOW COST HANDLING OF HEAVY MATERIALS IN QUANTITY WITH

magnet



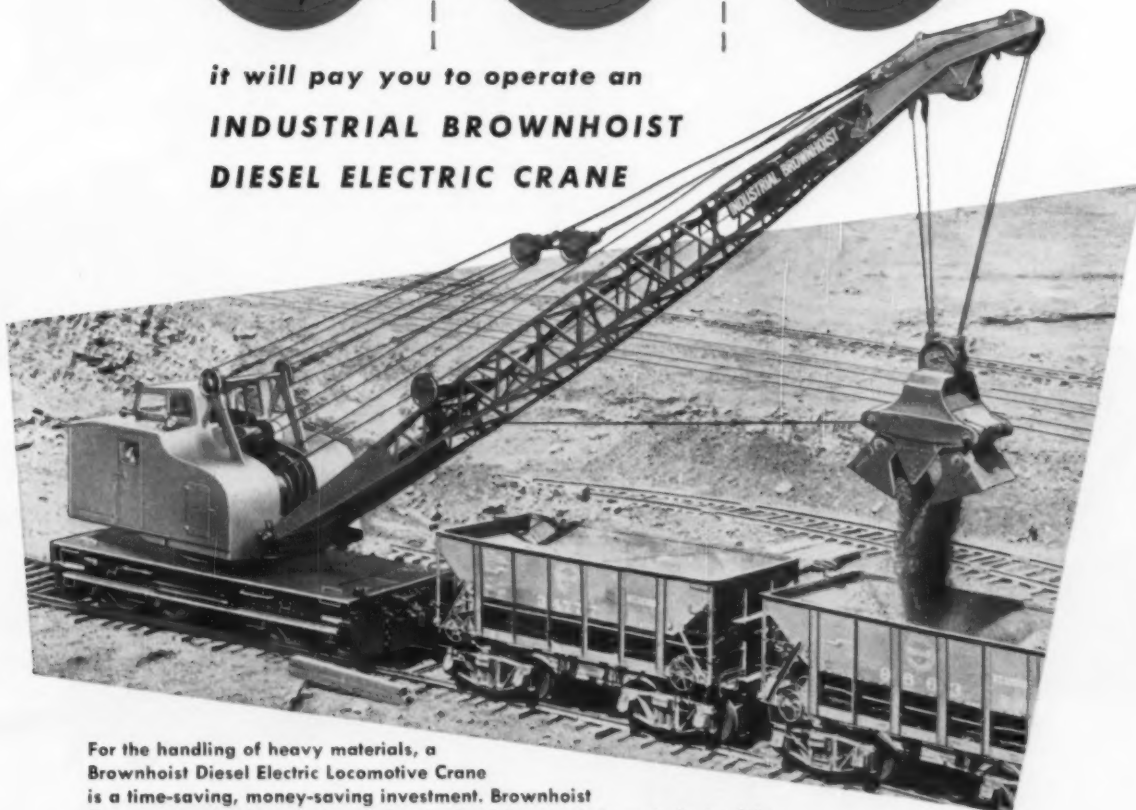
hook or



bucket



it will pay you to operate an
**INDUSTRIAL BROWNHOIST
DIESEL ELECTRIC CRANE**



For the handling of heavy materials, a Brownhoist Diesel Electric Locomotive Crane is a time-saving, money-saving investment. Brownhoist Cranes are today in operation in hundreds of America's largest plants, doing their work with a minimum of maintenance. Brownhoist cranes can save money by doubling as switch engines. They haul up to 7 or 8 loaded cars on straight and level track. All Brownhoist machines possess the famous Straight Line Power Train, which means you get the smoothest and most efficient crane operation. Brownhoist cranes give your operator greater visibility through the patented Monitor Type Cab and Clear Vision Boom, allowing him to work faster and with more safety. Electric swing available at extra cost on all models. Industrial Brownhoist Diesel Electric Locomotive Cranes are available in capacities from 25 to 100 tons. Write for Catalog No. 548.

192

BROWNHOIST MATERIALS
HANDLING EQUIPMENT
GIVES A LIFT TO
AMERICAN INDUSTRY



INDUSTRIAL BROWNHOIST CORPORATION
BAY CITY, MICHIGAN • DISTRICT OFFICES: New York,
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BROWNHOIST

HEAT • WEAR • CORROSION

HAYNES Alloys solve the *tough*

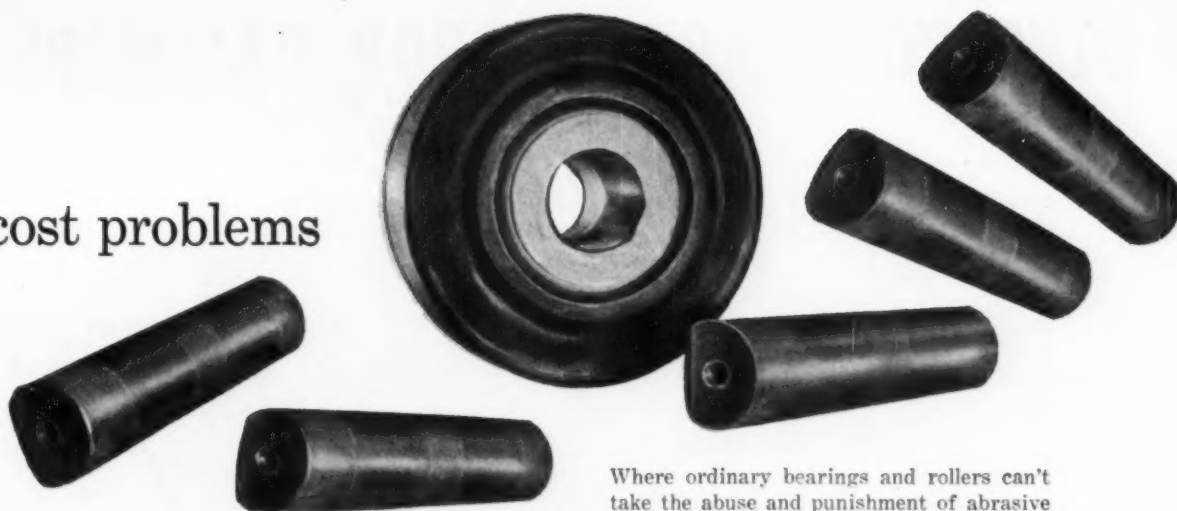


CORROSION

HASTELLOY Alloy B has a service life 30 to 40 times that of ordinary materials while handling highly reactive hydrogen chloride gas at a chemical plant.

In petroleum, chemical, or food processing industries—wherever you find highly corrosive conditions—HAYNES Alloys are long-wearing and most economical.

cost problems

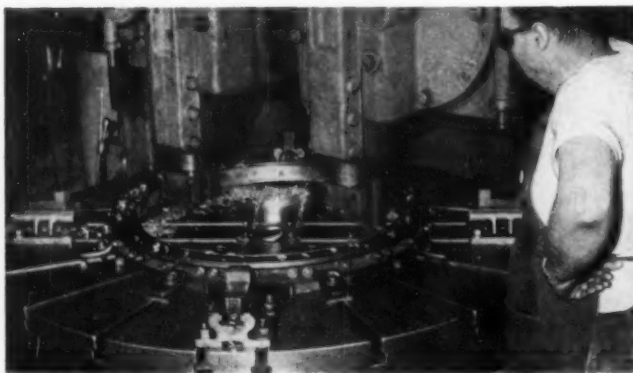


ABRASION

Where ordinary bearings and rollers can't take the abuse and punishment of abrasive rock and acid sludge, such as in mining operations, they are hard-faced with HAYNES STELLITE Alloy No. 6 and last for years instead of weeks! HAYNES Alloys reduce maintenance and replacement costs by giving long service.

Wherever you have a *tough* cost problem due to maintenance or replacement expense caused by excessive wear, heat, or corrosion, or where there is a complex design or production problem—investigate the use of HAYNES Alloys.

In practically every industry, you will find HAYNES Alloys helping to increase production and reduce maintenance—doing an efficient job at low cost. For information on HAYNES Alloys, contact our nearest sales office or write HAYNES STELLITE COMPANY, Division of Union Carbide Corporation, General Offices and Works, Kokomo, Indiana. Sales Offices in Chicago, Cleveland, Detroit, Houston, Los Angeles, New York, and San Francisco.



MACHINING

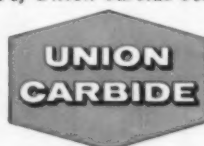
HAYNES STELLITE 98M2 alloy tools remove metal fast in machining jet engine diaphragm rings. These tools take a 1/2-in. cut and remove 55 cubic in. of metal in 15 minutes. About six rings now are machined per grind where other tools failed to finish even one. And tool service life has jumped over 600 per cent. Fast, precision machining with long tool life makes a big difference in production costs.

HAYNES

ALLOYS

HAYNES STELLITE COMPANY

Division of Union Carbide Corporation



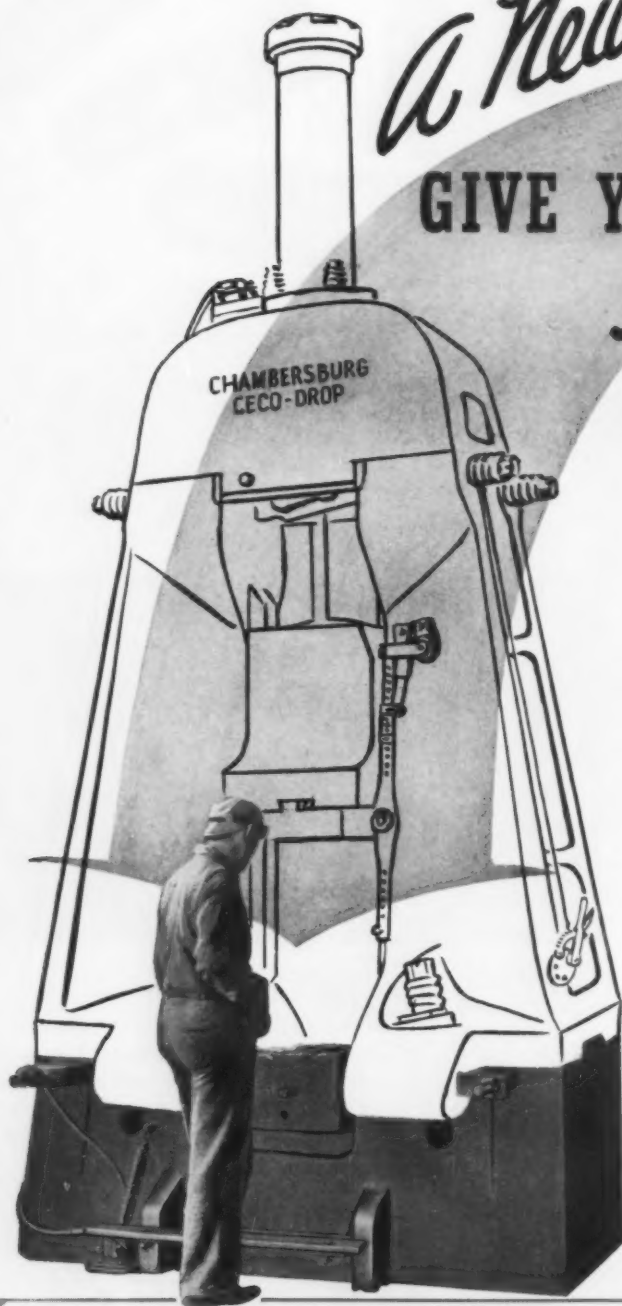
"Haynes," "Haynes Stellite," "Hastelloy" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

GIVE YOUR BOARD DROP HAMMERS

a New lift!

GIVE YOUR OPERATORS

New life!



**YOUR PRESENT ANVILS PLUS
CECO-DROP UPPERWORKS**

*can mean quick modernization
at a minimum cost
and can put new life in your operators*

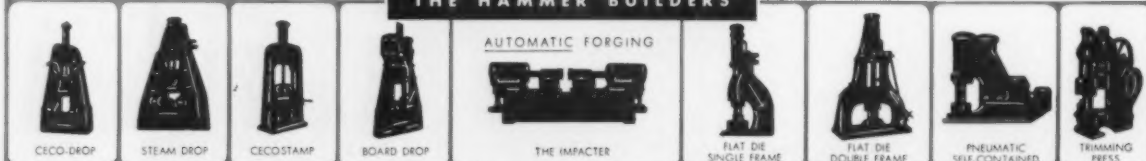
Here's a good suggestion: You can install Ceco-Drop upperworks on your existing board drop hammer anvils. Thus at a considerable saving you will be in a position to meet and beat tomorrow's stiff competition. You will produce more accurate forgings at a lower cost through more continuous production. You will have the most modern forging hammers available. Your hammermen will end their shifts fresh and still full of pep.

That's part of the Ceco-Drop story. The rest is in Bulletin 80-L-7 a copy of which will be sent on request. Write today.

CHAMBERSBURG ENGINEERING CO., CHAMBERSBURG, PA.

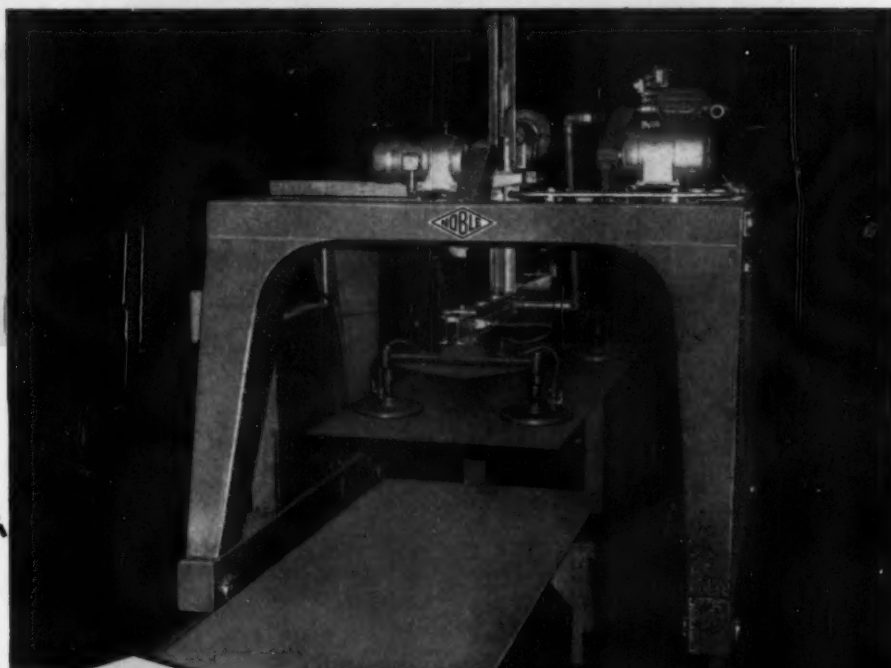
CHAMBERSBURG

THE HAMMER BUILDERS



PROCESSING PLATE?

Get the production you're paying for



WITH A

NOBLE

Automatic PLATE HANDLING SYSTEM

NOBLE Automatic Plate Handling Systems eliminate the costly, often hazardous manual handling required in processing plate and sheet.

NOBLE handlers automatically pick up from a pile or conveyor, transport and deliver plate or sheet stock to the machine, pick up worked pieces from the machine and deliver them to piles or conveyors. Increase your profits by:

1. Reduced handling costs — no handling crews required, no prolonged crane tie-ups.

2. Better machine utilization — NOBLE automatics deliver and remove plate as fast as the machine can operate. There's no idle standby while operators wrestle a plate into position.

3. Increased production — NOBLE users report gains of 20% or more, depending on conditions, as the result of faster handling and reduced idle machine time.



THREE TYPES AVAILABLE

Standard NOBLE automatic plate handling systems are available in floor-mounted rail, overhead rail and radial transfer types. Standard capacities are 1,000, 2,000, 3,000 and 4,000 lbs. Higher capacities and special designs for specialized applications.

NEW BROCHURE AVAILABLE... describes economics of automatic plate handling, proper applications, typical system layouts, and all NOBLE equipment required. Write for your free copy today; please address Dept. I-5.



P. O. Box 1979 • Oakland 4, California

Tubexperience in action



***"They use this Super Alloy tubing in missiles, rockets and jets
— so you know it can lick your heat and corrosion problems!"***

*"It's made by Superior Tube in your choice of 15 different materials. Believe me, this tubing can take the severest conditions of heat, corrosion and oxidation. Has very high fatigue and creep strength even at temperatures over 1000°F."

If you have a temperature and corrosion problem that causes failure no matter what type of tubing you have tried, get your Superior distributor to order Super Alloy tubing for you—it is the tubing for virtually every critical application of this nature.

Super Alloy tubing offers the important properties mentioned above, plus the dependability and longer service life built into it by Superior skills and experience. We will put your tubing

through many special examinations if you want us to—eddy current and ultrasonic, hydrostatic, and hot tensile tests, stress rupture tests, qualitative and quantitative analysis, and many others—for your complete assurance in its ability to perform as required.

Our continuing test program on Super Alloy tubing has amassed much useful information on mechanical properties. You will want to make a study of them and their potential for use in your applications. They are covered in our Bulletin 70. Send for copies. Superior Tube Company, 2004 Germantown Ave., Norristown, Pa.

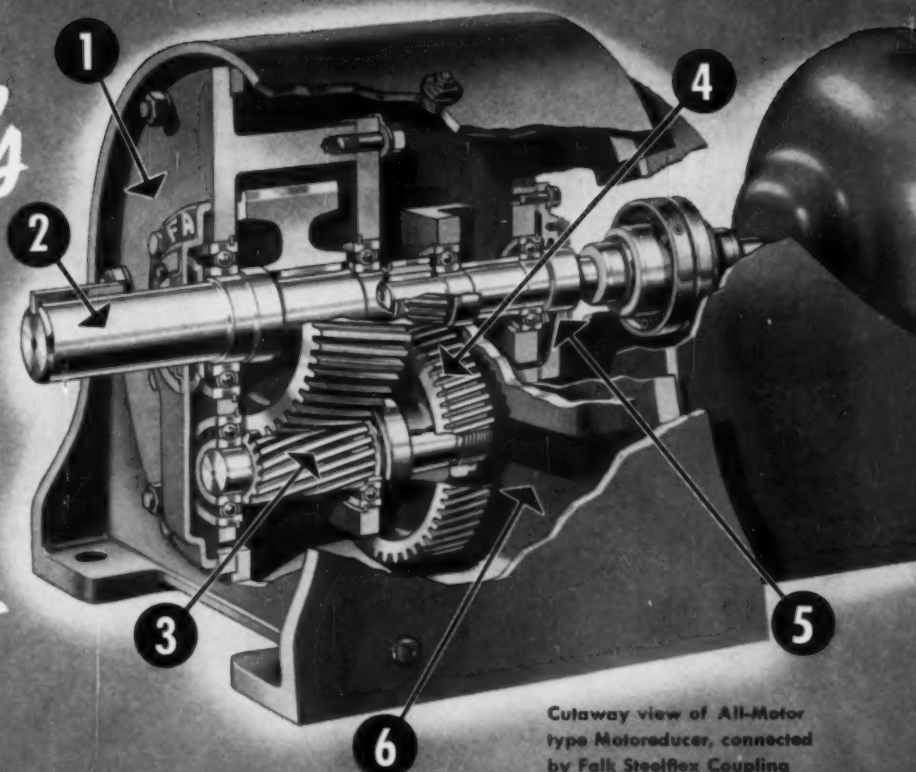
Superior Tube

The big name in small tubing
NORRISTOWN, PA.

All analyses .010 in. to 3/8 in. OD—certain analyses in light walls up to 2 1/2 in. OD

West Coast: Pacific Tube Company • 5710 Smithway St., Los Angeles 22, Calif. • RAYmond 3-1331

*Here's
the
inside
story—*



Cutaway view of All-Motor type Motoreducer, connected by Falk Steelflex Coupling to standard NEMA frame motor

WHY Falk Motoreducers give better service—have longer life

Here is the "inside story" behind the all-steel All-Motor type FALK Motoreducer's universal reputation as a gear drive unmatched in quality, efficiency, dependability, ease of maintenance and long life. These "In-built" factors are—

- 1 ALL-STEEL HOUSINGS.** Rugged, strong, rigid...all parts are manufactured from heavy steel plate, formed and welded in the Falk Weld Shop.
- 2 LARGE OVERHUNG LOAD CAPACITY.** Large shafts, oversize bearings...rigid mountings with wide bearing spans to handle maximum applied loads.
- 3 PRECISION GEARING.** Heat-treated alloy steel gearing, precision cut and shaved after heat treatment to eliminate distortion. Quiet, crown-shaved pinions.
- 4 EXTRA-CAPACITY GEARING.** Special extra-capacity gear-tooth form with larger contact area gives greater strength, higher load-carrying capacity.
- 5 SEALED HOUSINGS.** Splashproof, dust-proof, oil-tight construction. Dual closures and one-way vents keep oil in, dust and moisture out.
- 6 POSITIVE LUBRICATION.** Large sump capacity...oiltight construction assures clean lubricant...revolving elements lubricated by direct dip.

When you buy or specify the All-Motor type FALK Motoreducer, you get all these—plus the tremendous advantage of full interchangeability of motors. Switch motors as desired—use any make, style or type of standard foot-mounted motor within the unit's AGMA rating—with a minimum of difficulty or "down time."

Available in sizes up to 75 hp—with or without motor—from convenient factory, field or distributor stocks, from coast to coast. **Write for Bulletin 3100.**



60,000 HOURS WITHOUT A FAILURE!

Sixty thousand hours is a lot of hours—but the FALK Motoreducer in the unretouched photo above has served that long without failure or need of repair.

This 3 hp unit is one of over 60 FALK Motoreducers in daily service in an Eastern plant of a large milling company, whose president says, in part:

"One of the main advantages of FALK Motoreducers is their adaptability to any motor. Reducers and motors can be easily interchanged.... Our service records confirm the wisdom of our choice of FALK equipment as our standard."

FALK

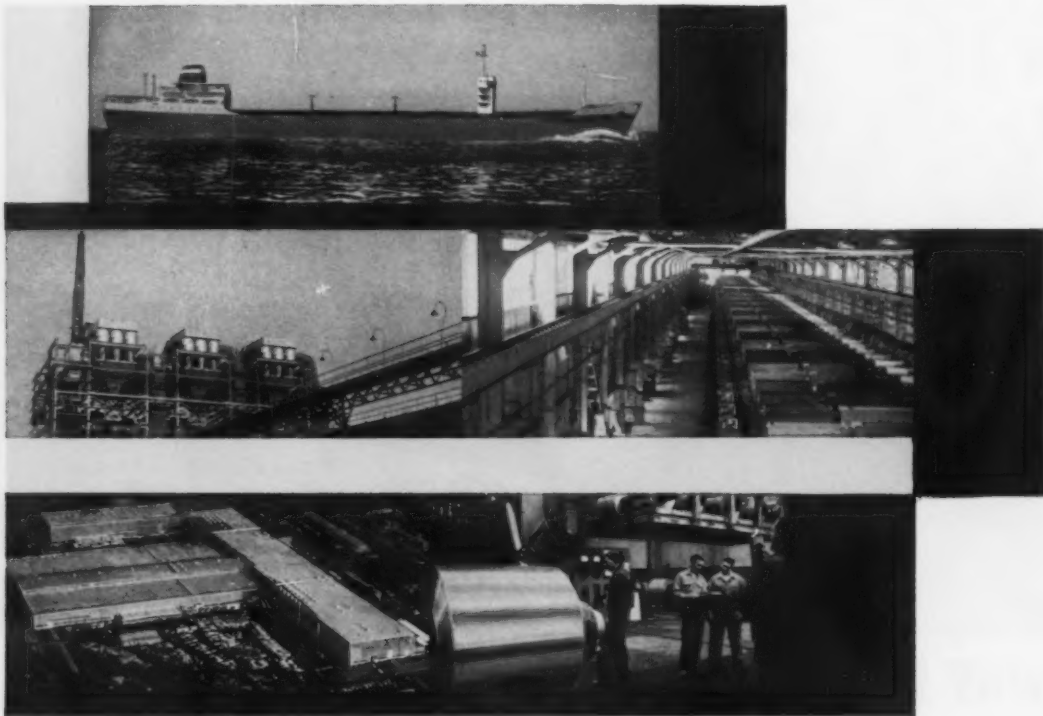
...a good name
in industry

THE FALK CORPORATION, MILWAUKEE, WISCONSIN

MANUFACTURERS OF

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

**Full integration makes
Olin Aluminum a
dependable source for you . . .**



Behind every finished order of custom-tailored Olin Aluminum lies a fully-integrated chain of production facilities reaching all the way to the ore fields at Surinam.

Control over every stage of the production of your Olin Aluminum — from ore field to alumina and reduction plants, and to strategically located processing mills—assures you of a dependable source of supply. Now and tomorrow.

Of equal importance, the services of Olin Aluminum Sales Representatives, Field Engineers and Production Engineers, working in cooperation with your own staff, assure you the kind of special customer satisfaction that has been an Olin Mathieson Service principle for years.

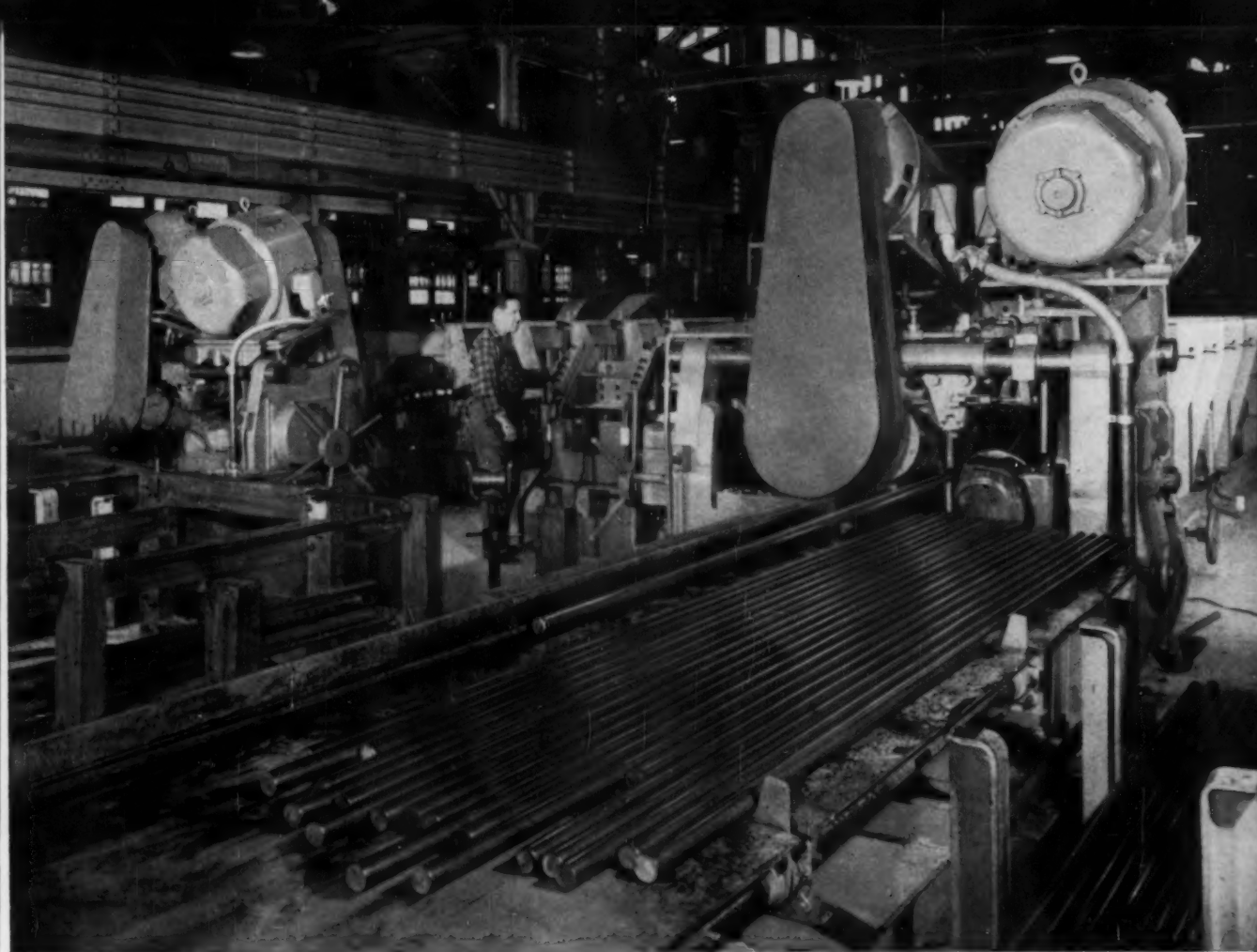
For service now, write: Aluminum Division, Olin Mathieson Chemical Corporation, 400 Park Avenue, New York 22, New York.

Q AND "OLIN ALUMINUM" ARE TRADEMARKS



Symbol of New Standards of Quality and Service in the Aluminum Industry





BLAW-KNOX-Medart provides high speed, precision finishing at **American Steel and Wire Cold Drawing Plant**

Two Blaw-Knox-Medart high speed, precision straighteners are handling the output of the new drawing line at the Cleveland Plant of the American Steel and Wire Division of U. S. Steel. The line operates at straightening speeds of up to 450 feet per minute on bars ranging in diameter from 1-inch to 4½ inches. The line is completely automated to the extent that bars are fed automatically from the shear to the stocking tables, into the feed troughs for the straighteners, through the straighteners and into the discharge storage cradles.

Either of these 2 and 2 Medart straighteners

is capable of handling the entire output of one of the high speed draw benches. High throughput is achieved by means of a completely enclosed V-belt drive to each roll. Roll speeds are synchronized by means of electrical interlocks between the motors.

The Blaw-Knox-Medart Straighteners are standard equipment for straightening and polishing in a direct production line with a draw bench. They are available in sizes to handle bars and tubes in diameters of ¼-inch to 10 inches. Contact your Blaw-Knox representative for information, assistance or service.



BLAW-KNOX COMPANY

*Foundry and Mill Machinery Division
Blaw-Knox Building • 300 Sixth Avenue
Pittsburgh 22, Pennsylvania*

YOUNGSTOWN SHEETS AND STRIP

Speed-Up Toughest Deep-Drawing Operations



Photo and Drawing courtesy of
Hydraulic Press Mfg. Co.



COLD ROLLED SHEETS AND STRIP

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yaloy Steel
General Offices - Youngstown 1, Ohio
District Sales Offices in Principal Cities

Modern high-speed precision drawing and stamping operations require only the highest quality steel if top production - low reject rates are to be maintained on difficult-to-run parts. And the highest quality steel produced anywhere is Youngstown Sheets and Strip.

Our satisfied customers, across the nation, tell us time and time again: "Our production is increasing—Rejects falling off—Fabrication costs are down." Why not make Youngstown your regular sheet and strip specification from now on—for improving both product quality and the overall profit picture.

When you use Youngstown Sheets and Strip you can be sure metallurgical quality will never vary because they are produced by steelmakers—with over 56 years experience—using only the most scientific quality control techniques. This guarantees a proper blending of the required ductility, tensile strength, flatness and surface to meet your exact specifications.

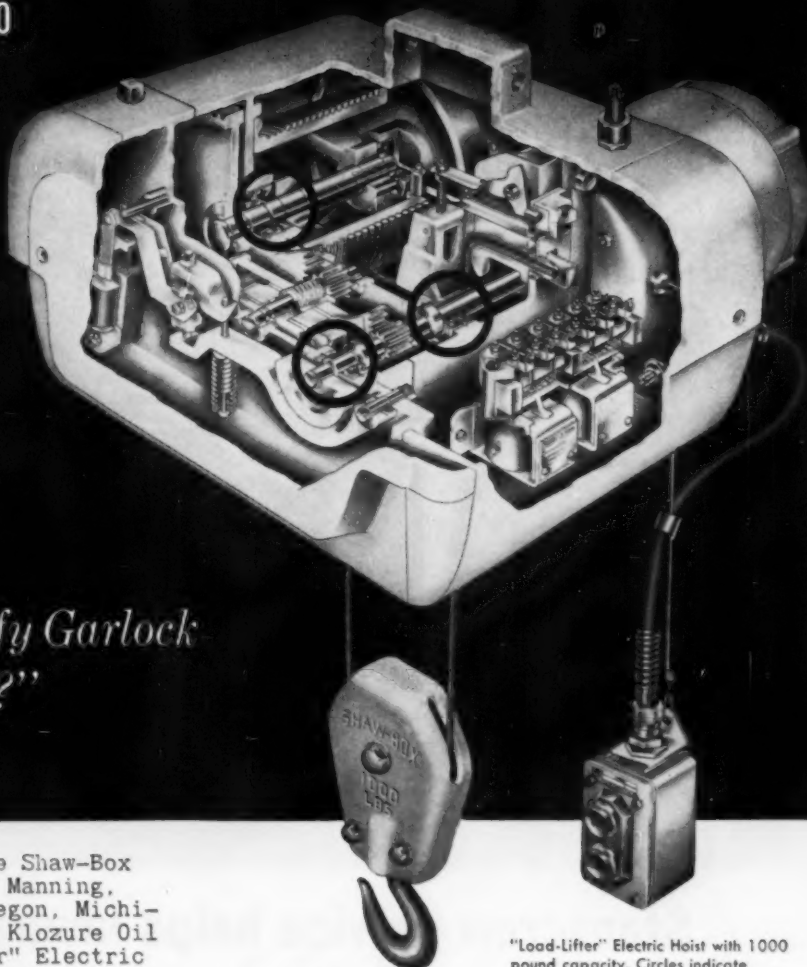
Why not call or write your nearest Youngstown District Office, today, for metallurgical assistance or additional information—or write directly to our Home Office.

MORE OF THE GARLOCK 2,000

We Asked

MANNING,
MAXWELL
& MOORE:

*"Why do you specify Garlock
Klozure® Oil Seals?"*

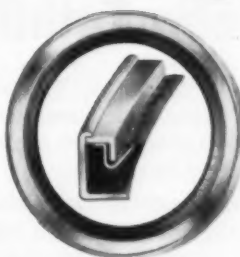


For the past five years, the Shaw-Box Crane and Hoist Division of Manning, Maxwell & Moore, Inc., Muskegon, Michigan, have specified Garlock Klozure Oil Seals for their "Load-Lifter" Electric Hoists. Recently, we surveyed the company to find what benefits they received by specifying Garlock.

Here is their reply:

"We use Klozure Oil Seals for three primary reasons.

1. dependability. Our hoist is designed for heavy duty use. A failure in any oil seal would shortly render the hoist inoperable. Therefore, we must use oil seals consistent with the quality built into the entire hoist.
2. long-life. The oil seal must permit easy maintenance and be reusable after hoist repair since replacement of oil seals during a minor overhaul is undesirable.
3. standardization. The fact that Garlock can meet nearly every oil seal requirement permits us to attain greater standardization of hoist components."



Cross section of Model 51 Garlock Klozure Oil Seal designed for medium-speed rotary service and low pressure reciprocating service. Two of these seals are used on the motor pinion shaft and a specially designed Klozure Oil Seal on the rope drum of the Electric Hoist illustrated above.

Garlock Klozure Oil Seals can serve your company equally well. Ask your Garlock representative for his recommendation from "the Garlock 2,000" . . . two thousand different styles of packings, gaskets and seals for every need. Or write for Klozure Catalog 20.

THE GARLOCK PACKING COMPANY, Palmyra, N.Y.

For prompt service, contact one of our 30 sales offices and warehouses throughout the U.S. and Canada.

GARLOCK



Packings, Gaskets, Oil Seals, Mechanical Seals,
Molded and Extruded Rubber, Plastic Products

IT PAYS TO STANDARDIZE ON STANSCREW



Stanscrew service helps insure quality for new Tuthill pump

Marvin Williams, Works Manager, Tuthill Pump Company, says: "Dependable, precision-built fasteners are an essential ingredient of the quality we build into Tuthill Pumps."

"Therefore, when we designed our new series of high pressure Powermax pumps, we had our distributor arrange for a visit from Stanscrew's fastener specialist. The socket head cap screws he recommended for this demanding application met the stringent standards we have established. And because of our years of experience with Stanscrew, we know we can count on precise product uniformity and fast service."

Hundreds of other leading companies in

American industry have also learned that it pays to standardize on Stanscrew. For Stanscrew offers a comprehensive line of over 4,000 different types and sizes of standard fasteners . . . including a complete selection of socket, set, and cap screws. These are produced in three modern plants by fastener specialists with over 85 years of specialized experience. All 4,000 items are always in stock . . . quickly available.

When you have a fastener problem, call your Stanscrew distributor. He will arrange for a prompt visit from the Stanscrew fastener specialist. The specific recommendations he will make can often mean important savings.



STANDARD SCREW COMPANY

FASTENERS

CHICAGO | THE CHICAGO SCREW COMPANY, BELLWOOD, ILLINOIS

HMS | HARTFORD MACHINE SCREW COMPANY, HARTFORD, CONNECTICUT

WESTERN | THE WESTERN AUTOMATIC MACHINE SCREW COMPANY, ELYRIA, OHIO

2701 Washington Boulevard, Bellwood, Illinois



Are You Getting What You Pay For?

When you pay for HIGH QUALITY high-carbon wire, you want to be sure you get it. You do, when it is supplied by Roebling.

It is unsurpassed in quality, consistently true to specifications, and absolutely uniform in gauge. Hundreds of manufacturers attest to this fact . . . the qualities that they *pay* for—they *get* in Roebling high-carbon wire. The length of our relationship with customers proves it.

We'll be glad to show you what we mean. For information on superior high-carbon wire or cold rolled strip, write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.



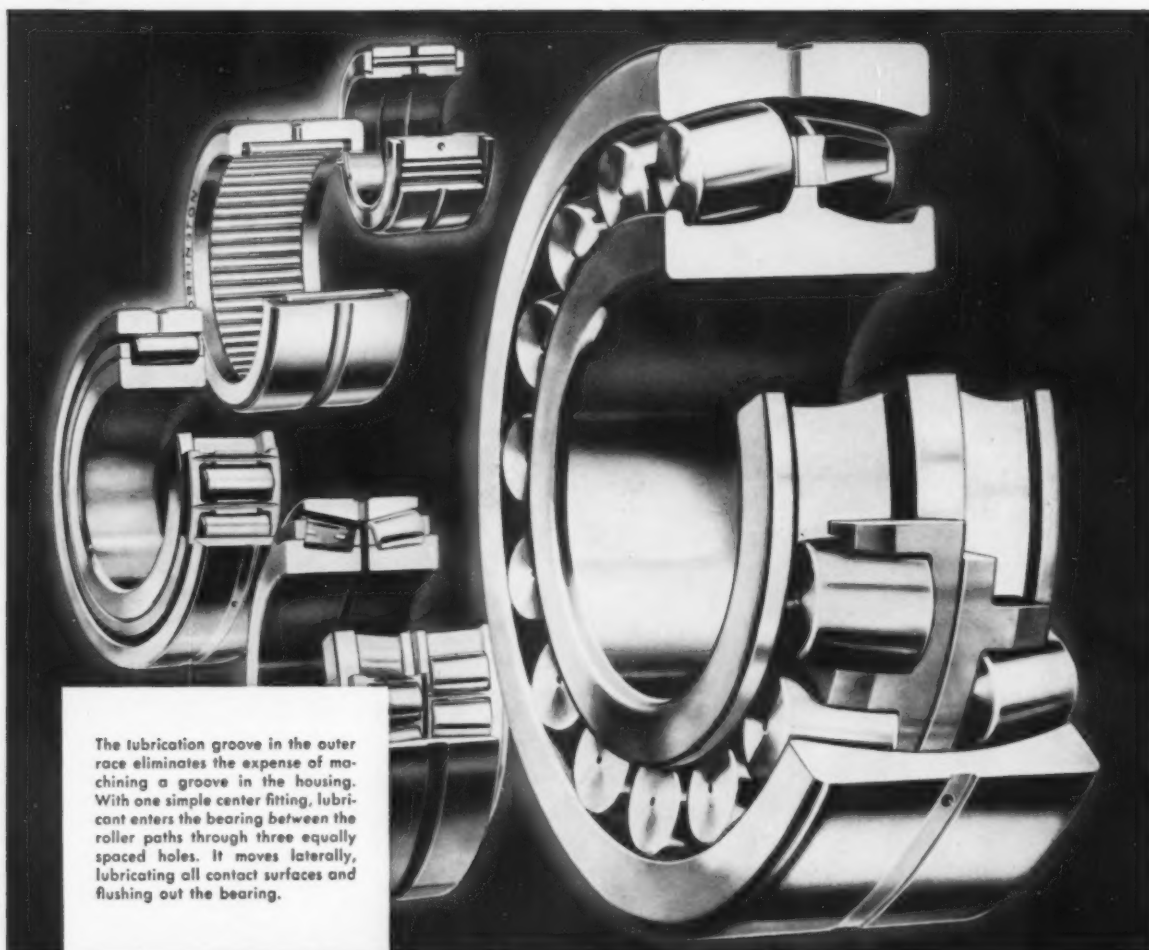
This lightweight "No Charge" spool is typical of Roebling's modern packaging methods that save customers time and money.

ROEBLING

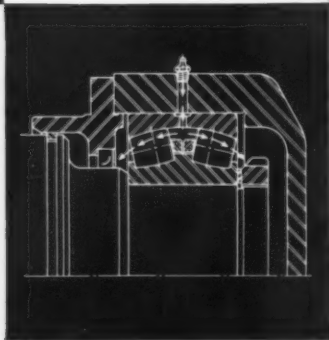


Branch Offices in Principal Cities—Subsidiary of The Colorado Fuel and Iron Corporation

Roebling... Your Product is Better for it



The lubrication groove in the outer race eliminates the expense of machining a groove in the housing. With one simple center fitting, lubricant enters the bearing between the roller paths through three equally spaced holes. It moves laterally, lubricating all contact surfaces and flushing out the bearing.



A time-proved lubricating method now available on Torrington Spherical Roller Bearings

The circumferential groove in the outer race has met the test of experience in many Torrington Bearings, including Heavy Duty Needle Bearings, Aircraft Type Needle Bearings, Tapered and Radial Roller Bearings. Now the circumferential lubrication groove is available in Torrington Spherical Roller Bearings.

This design feature makes it possible to introduce lubricant *between* the roller paths without the expense of machining a groove in the housing. This groove is proportioned to provide generous lubricant flow capacity. Lubricant moves through the roller paths, flushing used lubricant and contaminants away from bearing contact surfaces.

Torrington Spherical Roller Bearings in many sizes may be ordered with this groove as desired at no additional cost. For further information, see your Torrington representative or write: **The Torrington Company, South Bend 21, Ind.—and Torrington, Conn.**

TORRINGTON BEARINGS

District Offices and Distributors in Principal Cities of United States and Canada

SPHERICAL ROLLER • TAPERED ROLLER • CYLINDRICAL ROLLER • NEEDLE • BALL • NEEDLE ROLLERS • THRUST

Cope with Radiation

There are indications radiation protection problems can be effectively solved. One large firm says it has a record of no radiation injuries in 11 years of operating large atomic plants. There have been only two radiation deaths in 2.5 billion manhr worked in the entire industry under potential radiation exposure. Compare this with the death rate in average American industry in 1955 of 300 deaths per 2.5 billion manhr worked.

Foolproof Press Controls

Release of either switch of a dual safety interlock will stop the press cycle. But reclosing the opened switch will not re-energize the machinery. Thus one switch can't be locked in the closed position to defeat purposes of safety. The compact canned units are tamperproof.

Cart Before the Horse?

If you haven't yet faced the problem of machining superalloys and special metals you soon may. A recent survey of 500 plants shows that 23 pct of them are trying to cut these materials on a production basis. A host of troubles ensue because the machining properties of these metals have not been studied carefully. One authority proposes a uniform test to rate the machinability of each one according to its unit shear strength in cutting.

Longer Life for Mill Rolls

A modified method of roll finishing, now in operation at two steel mills, can increase mill roll life by as much as 50 pct. Test data has not been confirmed by long term use as yet, but it's already apparent that surface qualities of the refinished mill roll are improved.

Machining by Melting

Electron-beam machining, a recent German development, may be one way to shape space-age materials that resist conventional cutting techniques.

The process focuses a beam of high-speed electrons on the work and literally melts the material to "drill" a hole or "machine" a complex pattern. It's already in use on a small scale to form specific shapes in diamonds and ceramic products.

Hot Work Metals in Space?

While it's not feasible to keep a room under vacuum, filling the room with inert gas such as argon is just as effective in preventing contamination from air in hot working materials. It's being done by one concern under government contract. Operators don space suits with their own oxygen supply in order to move about and run heating, forging, and rolling equipment. The full length suits keep both exhaled air and body moisture from entering the room.

New Thermoplastic Resin

Early tests have shown a new acetal resin to have high strength, resilience and toughness, along with excellent flexural modulus and fatigue life. Applications run from many types of gears and bearings to such special uses as the spring for draftsman's dividers. The new material is expected to be commercially available in mid 1959.

Proximity Limit Switch

Mount a piece of magnetic material on a machine component and you can control motion with a limit switch having no moving parts. The unit's sensing head accurately picks up the approaching magnetic field and will deliver a direct-current output of several watts to tie in with other static or relay control units. The switch will operate up to 20 times per second.

Breakthrough in Broaching

A major machine tool builder is about to announce successful broaching of helical gears of cast iron, bronze and nylon. This will cut production time of such gears from minutes to seconds.

Puts squeeze on steel tubes...

TIMKEN® bearings put squeeze on costs

TO keep production high, downtime low, Aetna-Standard Engineering Company mounted the roll necks of their 16-stand tube stretch reducing mill on Timken® tapered roller bearings. One of the few of its kind in the world, this new mill, in operation at Jones & Laughlin Steel Corporation — Aliquippa Works, uses varying-speed rolls to reduce diameter and wall thickness of steel tubes.

Timken roll neck bearings give longer, trouble-free service because their balanced proportion design provides maximum bearing capacity in available space. And balanced proportion design means greater mill rigidity. With Timken bearings

roll neck strength is increased 50% to 60% and load ratings up to 40%. Their tapered design enables them to take radial and thrust loads or any combination. No expensive thrust devices are needed.

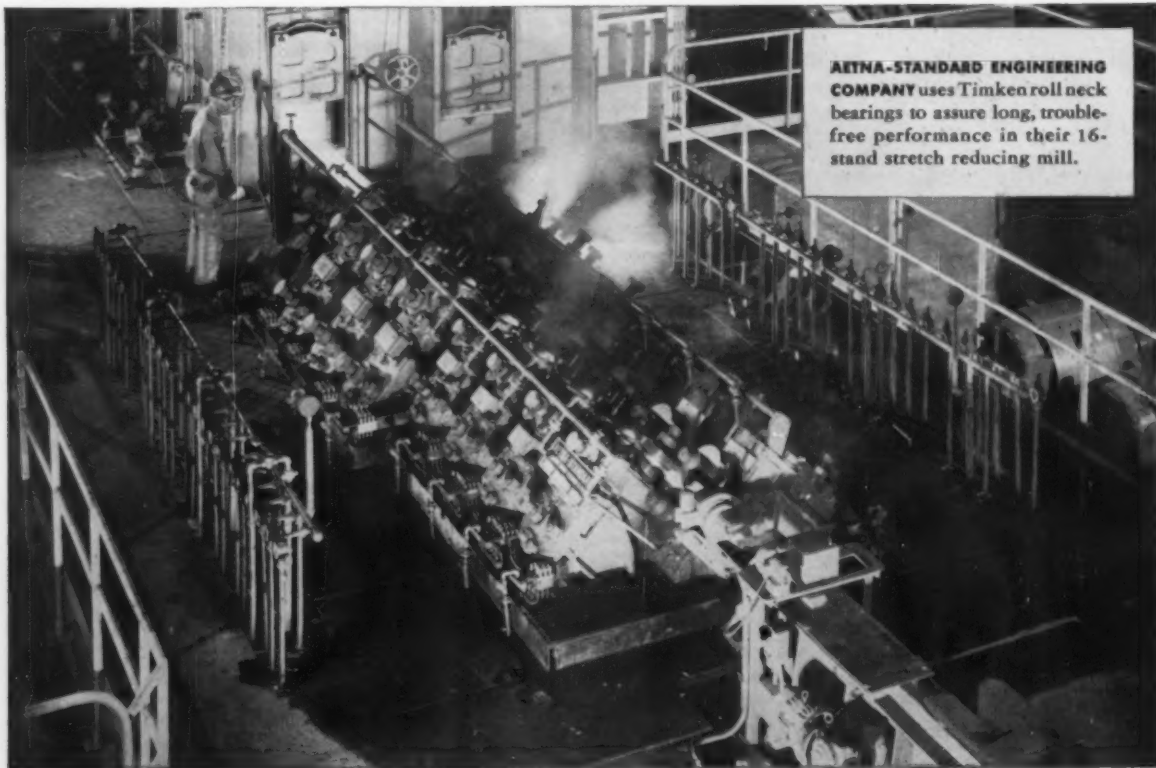
Mills with Timken bearings can be started under full load. No steel is wasted because of disturbed gauge settings. Higher rolling speeds are possible because Timken bearings are designed for economical grease lubrication. Rolls can also be changed faster.

Why not get all these advantages in the machines you buy or build? Or in existing machines? Timken balanced proportion roll neck bearings can reduce downtime, cut costs

for you, too. For full information, consult our roll neck specialists. Write The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



This symbol on a product means its bearings are the best.



TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS ROLL THE LOAD

The Chips Are Down As Slump Puts Labor on Defense

Here's a hard-hitting realistic appraisal of the labor outlook by Tom Campbell, The IRON AGE's editor-in-chief and veteran observer of the labor scene.

In typical fashion, Mr. Campbell analyzes the strengths and weaknesses of labor and management in the current automotive hassle, and looks ahead to steel's problems in '59.

■ The big labor-management show is on the road. The fracas at Detroit

between the Big Three and the United Auto Workers is window trimming so far. The barkers will be spiling their wares up to July 1959 when Dave McDonald of the United Steelworkers goes over a tough barrel or when Roger Blough, U. S. Steel head, has his hour of decision.

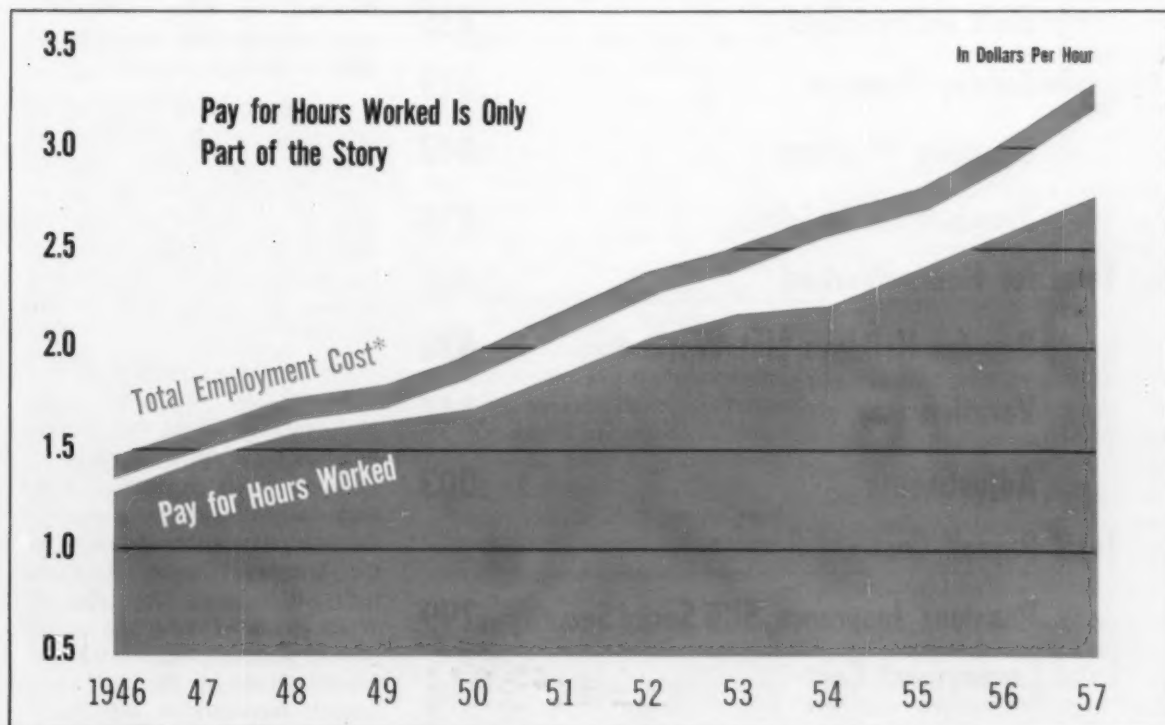
The action of General Motors in throwing down the glove to the UAW so the union could not strike one company and let the others go could have been done before. But no one in Detroit had the guts to do it.

Industry in Driver's Seat—What is to be decided in Detroit will not

be done in the newspapers or in press conferences. The auto firms have at long last made some sense in challenging Walter Reuther's divide and conquer tactics. With car sales down, inventories high, and the country in a recession, it is clear who holds trump cards. The auto firms do. But they have to live with Walter for quite a few years.

The bombast by both sides so far indicates that "this is the year." And if it isn't then next year will be. Management has spoken out against the yearly wage spirals. And this year GM has a chance to force down

How Steel Employment Costs Climb



*For Breakdown, See P. 58

Source: AISI

Mr. Reuther's throat either a strike or an extension of the present contract—or possibly a minor betterment over what he has now.

It's Management's Turn—Walter Reuther may be down but he is not out. No one knows that better than the Big Three. The auto companies have always belonged to the so-called liberal management group which wants production to go on while it meets reasonable demands. Part of this they had to do because the economy was with the UAW. This time the reverse is true so the carmakers are taking advantage of a situation made to order for them, but not by them.

But smart labor and management are ridding themselves of expedencies. Today's actions are an at-

tempt on the part of the management to put an end to the long wage-price spiral. If the economy does its part this year by refusing to show any betterment, then the auto firms will have the upper hand and will get a settlement which will not require any fancy hiking of car prices.

Reuther on Spot—If, however, the nation goes deeper into the recession and the Administration is forced into more pump priming and a tax cut, the rug may be pulled out from under the carmakers; if not this year then at the next bargaining session. Along this line it is significant that top officials of the AFL-CIO are turning sour on two- and three-year pacts. They feel there is a better bargaining chance with the yearly settlements on wages. Up to

now this feeling has remained pretty much within the AFL-CIO's ornate new quarters in Washington.

To sum up the auto labor picture: It isn't all black or white. Mr. Reuther is in the worst possible position so far. But if he backs down and takes a contract extension he will come back later and try to get good measure for what he thought he lost.

Steel Labor—While the auto hasle is on the fire the steel situation has a phony appearance of personal differences between David McDonald of the USW and Roger Blough of U. S. Steel. There is nothing personal in their broadsides against each. Both are going to take complete advantage of the economic and political outlook when their bout comes up in the spring of 1959.

The trial balloons put up by some columnists and steel officials on the question of the steel union foregoing a wage and fringe increase on July 1 were doomed from the beginning. It is hard to believe that anyone would approach the steel union with the suggestion that the contract be breached. Any labor-management man knows that this would be suicide for Dave McDonald.

Blough's Position — But by the same token the talk about foregoing a price increase while a wage increase goes through is also unrealistic. It is hard to see how Mr. Blough can do anything other than recommend an increase to his board. It may be smaller than at first thought.

The wage-price problem in steel is old hat. The real problem comes next year. Everything that happens this July 1 was set in motion by the five-week strike in 1956 and the back-door settlement pressure of the Administration's then Secretary of the Treasury, George M. Humphrey. It is hardly likely that the White House will enter the current steel labor-price situation. If it did, it would be, to say the least, hypocritical, especially if Mr. Eisenhower asked the steel industry to withhold a price increase while the

What Makes Up Steel Employment Cost

(Dollars per Hour, 1957)

Regular Pay	\$2.582
+ Shift Differentials	.035
+ Sunday Premium	.029
+ Overtime Premium	.047
+ Premium for Holidays	.036
= Total for Hours Worked	\$2.729
+ Pay for Holidays Not Worked	.038
+ Vacation Pay	.147
+ Adjustments	.003
= Total Payroll Cost	\$2.917
+ Pensions, Insurance, SUB Social Security	.299
= Total Employment Cost	\$3.216

Source: AISI

Roger And Dave: It's Nothing Personal



VERBAL ANTAGONISTS: Roger Blough of U. S. Steel (left) and Dave McDonald of steel labor have



been lambasting one another from the rostrum over wages and prices. Personally there's mutual respect.

union went ahead—as it will—to pick up what was negotiated two years ago.

McDonald's Dilemma—The fellow most likely to face his toughest battle since he took over the reins of the Steelworkers is Dave McDonald. Next year is the time the steel leaders will try to get themselves off the hook on the yearly battle. And last, he must at all times appear a militant, hard-headed and tough president of the Steelworkers.

Summing up his probable actions: He will continue the window dressing of slamming at U. S. Steel's Blough. He will mistakenly attack the steel industry on its pricing policy (neither the late Phillip Murray nor John L. Lewis ever expressed publicly much, if any, interest in the pricing policies of the companies with whom they negotiated). He will tighten up his organization to insure his election in 1961. And finally, he will soon, with his aides such as soft-spoken but hard-headed Arthur J. Goldberg, start to figure his strategy for next spring. If the recession is on then, he is lost or at least he

will get the least pleasant—to him—contract in his experience as head man in the USW.

Labor's Price Hit—Mr. Blough seems to be riding high over prospects for a labor contract next year. For more than a year now he and his aides have been lambasting the steel union in one speech after another. They have driven home their points that were it not for the annual "holdup" of wage rounds, steel and other prices would not be so high as they are. Further, Mr. Blough has accused the steel union and other unions of being more responsible for inflation in this country than any other person or factor. In his book, labor is pricing itself out of the market.

These speeches have made good reading. What the steel customers and several steel producers want to know is this: Will U. S. Steel take its toughest stand yet next year to stop the erosion of steel industry prestige and pricing policies by standing up to the union even stronger than in 1956? Right now the answer looks as if it would be a resounding "yes."

But there are qualifications over which even Mr. Blough has little or no control. As far as he is concerned he does not, as Dave McDonald suggests, "hate" the steelworkers union. In his more mellow moods he probably figures he could have much more troublesome people with whom to deal. So his feud with Dave is not personal: It is a hammering home of the idea that the yearly wage increases have got to stop if the nation is ever able to get off the inflation merry-go-round.

1959 Outlook—Based on what he has said publicly and based on his actions since he took over from Benjamin F. Fairless, it looks now as if Roger Blough will go down the line next year for a stoppage of what he considers to be raids on the country's economic blood bank.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

What 1st Quarter Profits Proved

Efficiency Kept Most Steel Producers in the Black

Despite reduced earnings steelmakers found a silver lining in the first quarter of '58.

Even though operating at far from capacity levels most of them still had a profit.

■ First quarter steel earnings were anemic.

But steel companies found reason for comfort: Most of them still operated in the black. Despite a dismal market that plunged operating rates into the 50's, steelmaking efficiency still wrung a profit from a poor quarter.

Encouraging Sign—This had a clear meaning to producers: Steel's profit-making potential was better

than ever. Replacement, modernization, or expansion of production facilities has already paid off in operating economies. More profitable quarters, industry leaders believe, only wait on a better steel market.

E. J. Hanley, president of Allegheny Ludlum Steel Corp., summed up the first quarter silver lining this way to stockholders: "Having shown we can operate in the black at levels representing only a little more than 50 pct of capacity we are eager to prove that with an adequate volume of business we can be more profitable than ever before."

Losses for Some — There's no denying that the first three months

of '58 were far from steel's best. Compared with the same period of '57 earnings for most companies were off from 40 to 95 pct. Some producers—including Colorado Fuel & Iron, Pittsburgh Steel, Detroit Steel, Copperweld, and Sharon Steel—operated at a loss.

In at least one case (Bethlehem Steel) declared dividends on stock were not fully covered by earnings. A. B. Homer, Bethlehem president, called this an indication of the company's confidence in the future

What Leaders Did—Among the six largest steelmakers, U. S. Steel had the best record when comparing first quarter '58 with first quarter '57. The Corporation's earnings this year were \$62.4 million, a drop of 46 pct from the \$115.5 million last year.

Bethlehem's profit fell by 53 pct from first quarter '57 levels, declining from \$53.4 million to \$24.8 million. Republic's earnings in first quarter '58 of \$8.5 million were 69 pct below the first quarter '57 total of \$28 million.

Youngstown Sheet & Tube was down 66.2 pct with \$3.5 million for this year as against \$10.6 million last year. National Steel reported first quarter '58 earnings as \$3.8 million as against \$13.5 million for '57, a decrease of 72 pct. Jones & Laughlin was 87 pct below last year's level with '58 earnings of \$1.6 million compared with \$12.8 million for '57.

Among other producers Continental Steel found the first quarter of 1958 the least trying. Earnings were down only 12 pct from the same period last year. Company profits for the initial three months this year were \$580,000 as against \$662,000 in '57.

Steel Earnings—1958 versus 1957

COMPANY	First Quarter 1958	First Quarter 1957
U. S. Steel	\$62,426,679	\$115,478,109
Bethlehem	24,819,490	53,427,655
Republic	8,583,506	28,052,826
Jones & Laughlin	1,657,000	12,823,000
National Steel	3,801,426	13,501,506
Youngstown Sheet & Tube	3,576,100	10,607,267
Inland Steel	7,961,147	14,613,704
Colorado Fuel & Iron	1,390,096*	4,552,392
Wheeling	505,000	4,550,000
Crucible	172,395	3,372,006
Pittsburgh Steel	968,881*	2,011,260
Granite City	2,055,182	3,421,451
McLouth	454,037	3,431,813
Barium	422,700*	156,035
Allegheny Ludlum	725,900	4,790,665
Detroit Steel	303,678*	1,008,166
Alan Wood	32,967	898,882
Copperweld	112,505*	988,994
Continental	580,839	662,262
Armco	9,171,693	15,487,752
Sharon	283,213*	1,592,644
Kaiser	1,734,426	7,784,118
Acme	439,827	2,234,451
Carpenter Steel	604,838	2,065,495
Eastern Stainless Steel	249,001	661,421
Jessop Steel	153,160	544,806

* Indicates loss.



MARKET: Atlas missile is one of the family of space vehicles making more extensive use of stainless.

Stainless Finds Market in Space

Disclosure of Atlas use of stainless hints of vast market for stainless in missile field.

Higher speeds and temperatures lead to selection of stainless for missile hull and parts.

■ Stainless steel is rapidly earning the title of Space Age Metal.

This is emphasized in disclosure that the Air Force Atlas intercontinental ballistic missile is made almost entirely of stainless steel.

Except for the huge warhead, which detaches after rocket burn-out, the entire protective skin of the missile is made of this iron, nickel and chromium alloy.

Tank Wall, Too—The skin does double duty, serving also as the walls of the propellant tank, contributing to an ultra-lightweight structure. These stainless integral tanks comprise nearly the entire length of the Atlas.

The missile is powered by liquid-fueled rocket engines and is designed to deliver a thermonuclear warhead 5500 miles. The airframe is manufactured and the entire missile is assembled by Convair Div. of General Dynamics at San Diego.

On Assembly Line—Since the Atlas is designed to be manufactured with assembly line techniques, use of large quantities of stainless steel indicates a present and potential volume market for stainless in the growing missile and rocket field.

Use of stainless in the aircraft, missile and satellite field grows as speeds and temperatures rise. Its high corrosion resistance is also a big asset when corrosive propellants (like white fuming nitric acid) are used. Examples are the propellant tanks of the Bomarc missile and Vanguard rocket.

Other Rockets—The Army's Ex-

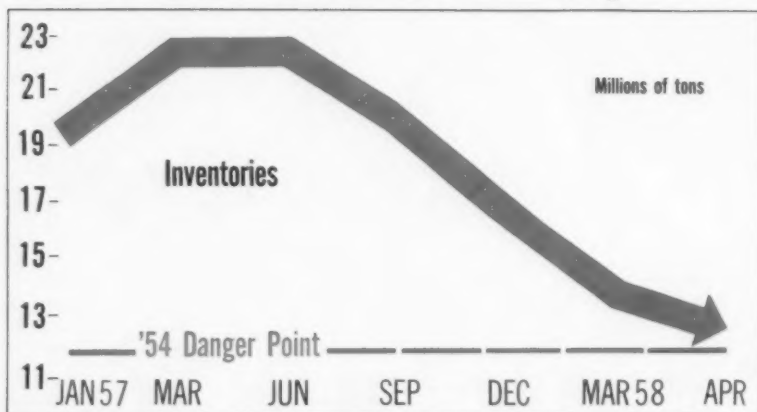
plorer satellite mounts a 13-oz blunt nose cone of thin gage 430 stainless. The Farside rocket's last stage was also protected by stainless, to name some stainless applications that can be disclosed.

The large scale use of stainless steel in the ICBM program was just recently revealed by Convair to the Committee of Stainless Steel Producers, American Iron and Steel Institute. Information on fabrication and assembly is still restricted.

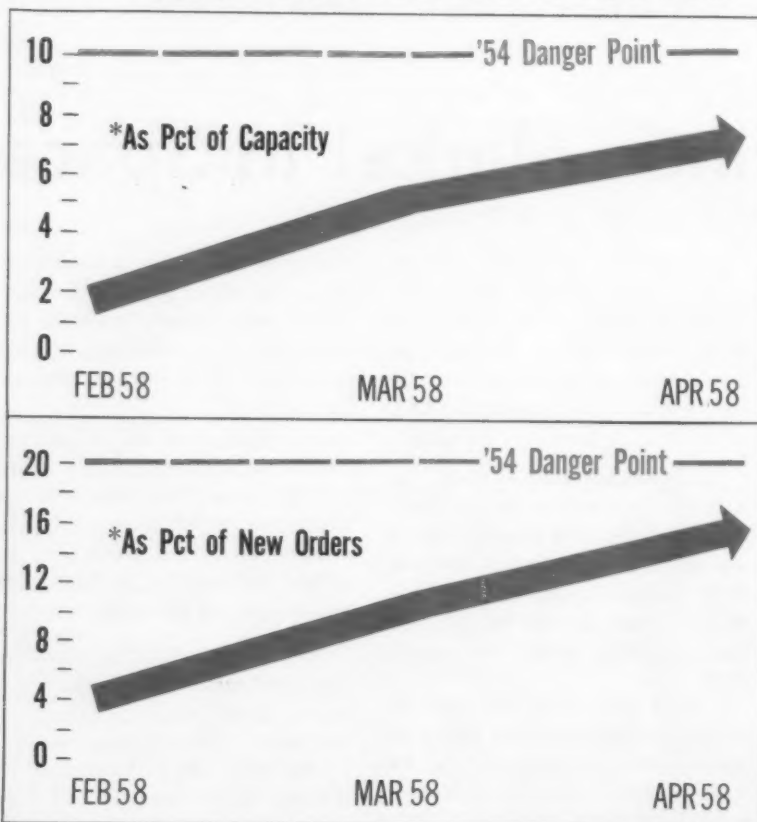
Why Stainless?—The Atlas has been fired successfully several times over limited ranges from Cape Canaveral. Stainless was specified for the Atlas chiefly because of its extreme tensile strength and high temperature and corrosion resistance. These characteristics result in a strength-weight ratio which allows the designer to utilize stainless in thin sheet to achieve the desired lightness with strength.

Stage Is Set for a Steel Surge

As Steel Inventories Drop . . .



. . . Steel Rush Orders Mount*



DANGER POINTS: Steel men say that the volume of last-minute rush orders from their customers is approaching the same level that proved to be the market turning point in 1954. They add that if their analysis is correct, steel users in the next eight weeks could reverse their inventory policy from one of inventory cutbacks to one of inventory buildup.

Order books are still slack, but steel men predict an upturn based on past performance.

They can't take any more rush orders.—By G. J. McManus.

■ The stage is set for a sharp pickup in steel production.

If past performance means anything, steel ingot output should jump 10 points in the next eight weeks. Monthly steel shipments figure to climb at least one-half million tons in the same period.

This is brave talk at a time when mills are operating at half speed, and order books give no hint of an upturn. Yet some steel men feel 10 points is a conservative estimate of the coming upswing.

Inventories Near Bottom—They point out an end to inventory slashing would add a million tons a month to steel shipments. And steel stocks are approaching a minimum point, they believe.

"At some point in the next month or two, a plant is going to come in and ask for rush delivery of steel," says one mill official. "The plant will be told it can't get the delivery it wants. Or it may get a promise but not the actual delivery. If the plant loses production because of the steel delay, it will start thinking about forward booking and more inventory."

No More Rush Orders—The mills are approaching the point where they can't take on any more rush business. Here's what's been happening: Steel users liquidated 4 to 6 million tons of stock in the second half of 1957, dropping the level to between 16 and 18 million tons. Cutbacks continued through the first quarter of 1958 at the rate of about a million tons a month. Plants relied more and more on fast mill delivery. In February of this year, mills were delivering 4 pct of their orders in the month received. In

March it was 10 pct. By April it was up to 15 pct.

By the end of this month, the mills figure to be handling about 20 pct rush orders. That works out to 10 pct of total capacity. And that's about as far as you can go. When rush orders pushed 10 pct of capacity in 1954, deliveries began to lengthen. At this same point, customers began building inventory.

When?—Steel experts warn you can't go by the amount of idle capacity in gaging delivery. The mills could double their output, but they can't double the amount of rush production. Ingot output never went over the seventies in 1954 but people were waiting for steel.

None of the figures on the current situation are precise enough to really pinpoint the upturn. But with inventories close to the bottom, rush orders near the ceiling. If you add the pressure for price buying, June looks like the logical month.

Consumption Key—Big question mark is steel consumption. Last year industry chewed up about 7 million tons a month. Consumption is running about 6 million tons a month this year. If this level holds, steel shipments have got to rise.

Some feel the timing of the steel upturn could be important. An early surge could carry related companies along and provide a psychological lift for the whole economy.

A Likely Candidate—Steel has the makings for a spectacular surge. The biggest part of its trouble has been inventory. Last January, shipments of steel products were close to 8 million tons. This January they were a little over 5 million tons. Two-thirds of the drop was due to inventory. Industry was adding a million tons a month last year; it was cutting the same amount each month this year.

If inventory cuts only slow down in June, shipments could easily go up 500,000 tons. If the cuts stop, shipments would rise 1 million tons. If there is some inventory buildup, the gain would be over 1 million.

Business Increases Aid to Education

■ Without benefit of cap and gown, American business continues to be a major force in higher education.

Apparently its greatest contribution is in picking up the check. For the two-year period of 1956-57, corporate giving netted the nation's colleges and universities about \$100 million, estimates the Council for Financial Aid to Education.

Survey Results—This figure is based on a new survey of private contributions to higher education just released by the Council. The 904 institutions represented in the survey received almost \$77 million from business and industry, excluding contract research grants.

The figure does not include gifts to students as scholarships or fellowships, nor such contributions as General Motors' support of the General Motors Institute, and other gifts from corporate foundations.

All in all, total giving probably exceeded \$100 million for business.

Big Increase—The \$77 million

figure represents a 95 pct increase over business giving in the 1954-55 period. This total is expected to grow, despite a possible setback this year.

College gifts from all sources reached a new high in the period. Total giving to 910 reporting institutions reached \$833 million.

As it did in 1954-55, business again ranked fourth highest among voluntary support sources with \$76.9 million, or 9.41 pct. Top source was general welfare foundations with \$319.1 million, including a \$119.5 million Ford Foundation gift.

Second is alumni with an estimated \$101.1 million. Third largest was religious dominations with \$78.1 million.

Despite the current recession, the Council believes that business will continue to be a strong supporter of higher education. The Council points out that business giving continued to climb after expiration of excess profits, and is expected to continue the upward trend.

Where Business Gave—1956-57

Major Private Universities	\$32,874,178
Private Coeducational Colleges	19,163,150
State Universities, Land-Grant Colleges	10,143,819
Professional or Technological Schools	7,035,503
Private Women's Colleges	3,610,770
Private Men's Colleges	3,096,007
Junior Colleges	600,682
Municipal Colleges & Universities	375,653
TOTAL	\$76,897,762

Source: Council for Financial Aid to Education

New Control System Cuts Costs



FOR THE RECORD: It takes the Telecontrol dispatcher about 15 minutes to transfer production data from control cabinets to a five-channel tape add-punch machine for subsequent appraisal by management.



ACTION: The foreman plugs his portable telephone headset into the control box right at the machine to notify the monitoring room what action must be taken to get the equipment back into production.

The question: How to cut production costs?

The answer: Management must get closer to production lines.

A possibility: Telecontrol—a new electro-mechanical communications system.

■ In an auto parts plant in Jackson, Mich., management can tell, almost at a glance, how each of 200 production machines is functioning.

The managers of Hancock Manufacturing Co., can also determine, without visiting the production floor or conferring with an on-the-spot foreman, the current status of a given order, how much is being produced, where, and what it costs.

Big Savings — The system that makes this possible is called Hancock Telecontrol, designed and installed by Hancock Industries, parent company of Hancock Manufacturing. It's essentially an electro-mechanical system which links production machines to a central monitoring room.

In more than a year of operation, Hancock estimates the system has saved more than \$100,000 — \$80,000 in reduction of nonproductive payroll, and \$20,000 in reduced downtime.

Management Tool — But its greatest advantage, according to Hancock, is that it provides management with up-to-date, accurate facts and figures on current production and its associated costs without the usual delays and extensive paperwork.

The same system will go into production shortly at the General Electric Household Refrigerator Plant, Appliance Park, Louisville, Ky., according to Hancock Industries.

How It Works—Here's how the system works:

Each production machine has a control box linked to a control cabinet in the monitoring room. Information is conveyed continuously from production stations and recorded in the monitoring room.

Each production machine has its own separate display on the control cabinet, and 20 of these displays mount in one control cabinet. On these display panels, electro-mechanical counters record the number of parts produced within the shift.

Production Run Preset—Another indicator, called a balance counter, is preset before a production run is started to the total number of parts needed. When this total is reached, the production supervisor in the dispatch room is alerted by a flashing green light and an audible "beep."

At the end of a shift all production statistics are transferred from the control cabinets in the monitoring room to an add-punch machine and recorded onto a five-channel tape for the accounting, planning, purchasing, production, and engineering departments.

Downtime Cut—When a machine breaks down or runs out of raw material, the operator merely pushes a button which signals dispatchers manning the control room. A foreman is dispatched to the machine within minutes. If a maintenance man is required, the foreman calls the monitoring room which relays the message to maintenance.

Payroll Savings — Hancock reports that two dispatchers now man the entire production control operation for each shift, compared to eight non-productive workers carrying out a basically similar job before installation of Telecontrol.

The cost of monitoring 200 machines, according to Hancock, is about \$250 per unit. For a lesser number of machines to be integrated into a control system, cost per machine increases slightly.

Politics Blocks Depreciation Relief

The subject of easier depreciation rates for industry is a hot potato in Congress.

Lawmakers who might otherwise favor aid are fearful of voter wrath.

■ Election-year politics appears likely to block any major revision in depreciation laws this year unless it can be tacked onto a general business or personal tax cut.

A technical revision, which will give a special break to buyers of used machinery, is probable, however.

Congressional interest in a major overhaul of the depreciation laws this year is at a recession-inspired peak. But at the same time, neither Republican nor Democrat leadership in private talks is now willing to push legislation to give business a better break on depreciation, even on a temporary basis, unless they can also give a cut to other taxpayers.

Reaction Feared — The politicians, facing tough election campaigns this summer and fall, say they are afraid that a multi-million-dollar cut in depreciation without personal or other business tax cuts might bring dangerous reaction from the voters for the party which sponsored it.

Capehart Plan — Among these proposals is one introduced recently by Sen. Homer Capehart, R., Ind. The Capehart proposal would cut in half present depreciation periods for assets having an average useful life of 15 years or less. For capital assets having a longer life, the depreciation for the first 15 years would be halved, and that over 15 years would be cut by two-thirds.

The measure would be retro-

active to Jan. 1, 1958, and would apply to new assets purchased or contracted for through 1959.

Industry Plan — Another proposal, sponsored by the machine tool builders, would permit a flat five-year depreciation to be taken on machine tools or other productive equipment purchased between last Jan. 1 and June 30, 1959.

This program would call for a long-term abandonment of the present Internal Revenue Service depreciation policies in favor of a "bracket approach" which would reduce the present 15 to 25-year depreciation period for most tools to 10 years or less.

The limited depreciation change, now pending, would help some. This proposal, backed by the Eisenhower Administration and a host of Democrats, is part of a four-part tax revision package aimed at aiding small business.

Choice of Formulas — It would permit purchasers of used machinery to apply the sum-of-the-digits or declining balance methods of computing depreciation. These methods, presently permitted on new equipment, tend to reduce taxes by increasing depreciation in the early years after a purchase.

A special business-government committee appointed by the Internal Revenue Service, has turned over to the Treasury Department for approval a revised draft of the so-called Bulletin F. This is the government's "suggested" table of useful lives.

Some reduction in useful lives under previous issues of the bulletin are expected. But IRS officials say major reductions are impossible as present laws require depreciation schedules to follow the normal average life and clearly mean the mechanical life of equipment.

Appliances Look Ahead to 1960

All Signs Point to Record Sales, New Expansion

The entire appliance industry is banking on an unprecedented boom in the next few years.

And they're far from gloomy over prospects for the immediate future.—By K. W. Bennett.

■ An appliance maker who completed a \$40 million expansion program in 1957 comments: "We should have enough capacity now to carry us through 1960. Then we'll have to begin all over again."

His company doesn't anticipate any slackening of consumer demand for home appliances. Neither does the top-flight appliance market analyst who predicts that we will see the beginning of "the biggest boom yet" in 1960. "It will last through 1967," he forecasts,

"with a probable peak in 1964."

Straws In Wind—Recent improvement in the short-term appliance picture indicates the buildup for the 1960 boom may already be starting.

Hotpoint's President John C. Sharp explains that refrigerator inventories are below levels required for the summer selling season, and have been since March, when refrigerator sales moved well ahead of production. Confirming earlier reports (The IRON AGE, Mar. 6, '58 p. 78) Mr. Sharp announces that his company is boosting refrigerator production. Other important producers also have started stepping up production.

Expansion Slowdown—But while

the industry's production begins climbing, its capital spending in 1958-59 will drop about 30-35 pct from the record 1956-57 levels. This is no cause for viewing this capital goods market with alarm. The expansion cutback is not unexpected nor is it unprecedented.

The 1956-57 period marked the high point in an appliance industry building boom that began in 1953. It is phasing out now—a period when the industry is operating at an estimated 55-60 pct of capacity.

History Repeats—There were similar cutbacks by the industry in 1949 and 1952 when capital expenditures fell about the same amount. In any case, spending by the appliance industry will continue through both 1958 and 1959 at higher levels than in either 1949 and 1952, and probably exceeding those years by about 15 pct. Spending this year and next is expected to equal the 1949-56 average annual outlay.

As one industry spokesman put it: "If anybody's still satisfied with mere prosperity after three years of boom, they'll find plenty of business in supplying the appliance companies."

Some Exceptions—Another reason why the appliance market should not be written off as a poor prospect for capital equipment is that a number of important firms aren't following the industry pattern.

When the last expansion boom began, appliance builders had their long-range sights set on 1960 for a number of sound reasons (see box). That year is still their goal.

If the appliance business levels of 1955-56 are to be topped as expected in 1960, then the manufacturing total for that year could exceed 18 million units—a figure that would strain present capacities.

Why Appliance Makers Are Optimistic

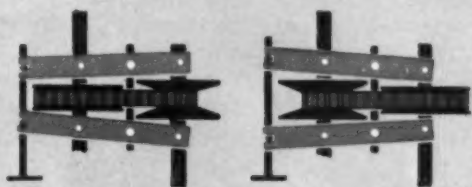
The appliance industry's record growth in production capacity from 1955 to 1957 is aimed at the year 1960, when the biggest boom yet is expected to begin. Here's what the industry is counting on:

Long-range Growth: Since the early 1930's the industry has pushed upward at an average rate of about 4 pct a year. By 1960, minimum demand will be 10 pct over present minimum levels.

Family Formations: Between 1961 and 1967, the number of new families formed will skyrocket, probably to all-time record levels.

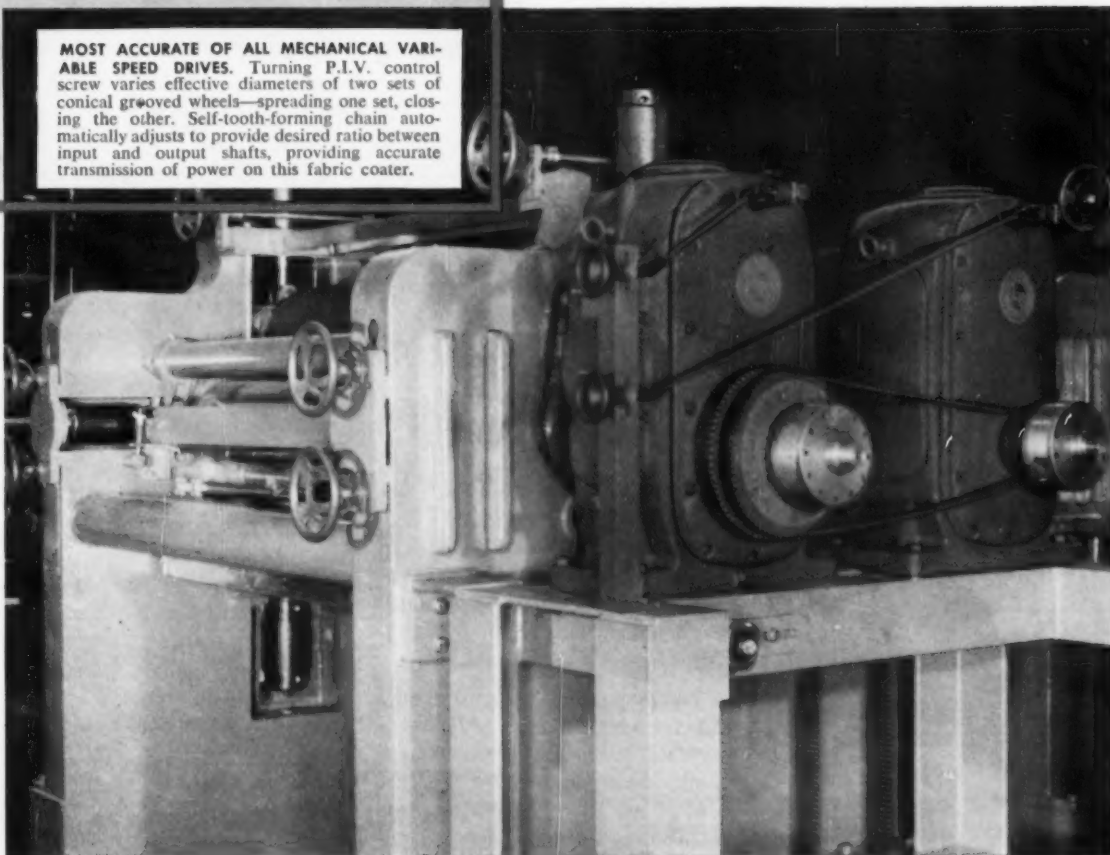
New Products: The entire electrical machinery industry is expected to multiply its take from new products by seven times in the next 7½ years.

Replacement Sales: Worn out or outmoded appliances sold during the strong sales period of 1950-55 will be up for replacement.



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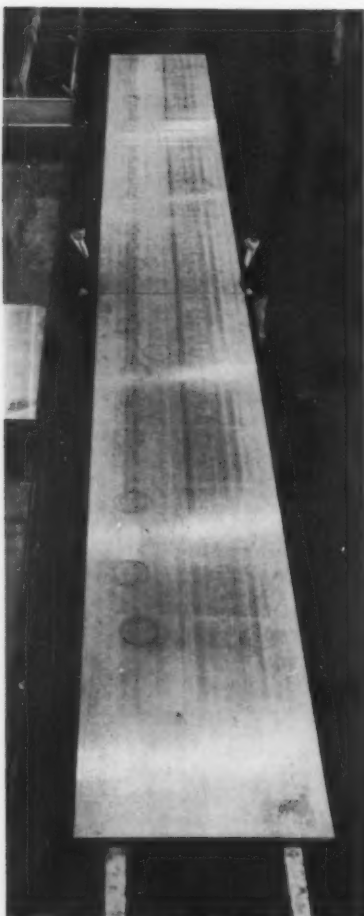
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Aluminum Plate Is Largest Ever



KING: Reynolds Metals Co., McCook, Ill., plant claims the record for rolling the largest aluminum plate. Its entry weighs 11,376 lb., is 52½ ft long, 6¼ ft wide, and 2½ in. thick. Reynolds admits plates rolled by themselves and other mills have been longer. But, they say, none has been as heavy or as thick.

No sooner had the new record been set, than Reynolds turned around and rolled another plate the same size. Lockheed Aircraft Co. plans to use both as chucks in its aircraft skin mill at Burbank, Calif.

The new record probably won't last long. Reynolds has already cast a 23,900 lb ingot in preparation for rolling an even bigger plate.

Campbell on TV

Tom Campbell, editor-in-chief, *The IRON AGE*, will present management's view of the wage-price spiral on Columbus, Ohio's famous "Town Meeting of the Air" Sunday, May 11. The forum will be broadcast over TV Station WBNS-TV between 1 and 2 p.m.

Other participants will include a representative of the AFL-CIO and the U. S. Dept. of Labor, Washington, D. C.

This will be a return engagement for Mr. Campbell, who gave the management side of the industrial pension question on the same program in 1949.

Senate Leaders Buck Unemployment Bill

Senate Democratic leaders are plotting to replace a limited House-passed bill extending unemployment compensation with a program of their own.

The House version, which may result in higher unemployment taxes for businesses in some states, was a major victory for conservative forces in Congress.

Try to Add — Principal points the Senate Democrats will try to add are provisions extending unemployment pay for a flat 16 weeks, instead of by 50 pct; and extension of unemployment benefits to the 25 pct of the work force not now covered by state plans.

The plan is similar to a Democratic proposal soundly beaten in the House last week by an unusually strong coalition of conservative Northern Republicans and Southern Democrats. This alliance successfully substituted an Administration-backed bill, providing for the 50 pct extension in state plans financed by loans from the Federal government.

States' Choice—The House bill, unlike the original Eisenhower proposal, does not require states to participate. A possible change when the bill reaches the Senate would permit administrative agree-

ments between the states and the Federal government for participation in the new emergency program. States choosing to get the loans would not have to hold special sessions of their legislatures.

The bill would cost the government about \$600 million, compared with \$1.5 billion for the Democratic proposal. It would provide extension of state benefits ranging from 2.5 (Florida) to 15 weeks (Pennsylvania). There would be no change in payment.

Aid to Education

United States Steel Foundation, philanthropic arm of the Corporation, announced it would give \$2 million to 655 privately supported liberal arts colleges, science and engineering institutes, public and private universities, and medical schools in 1958.

Alcoa Income Off

As expected, net income of Aluminum Co. of America in the first quarter was considerably less than income for the same period last year.

Total for January-March 1958 is \$11.4 million, for 1957 period it was \$18.6 million.

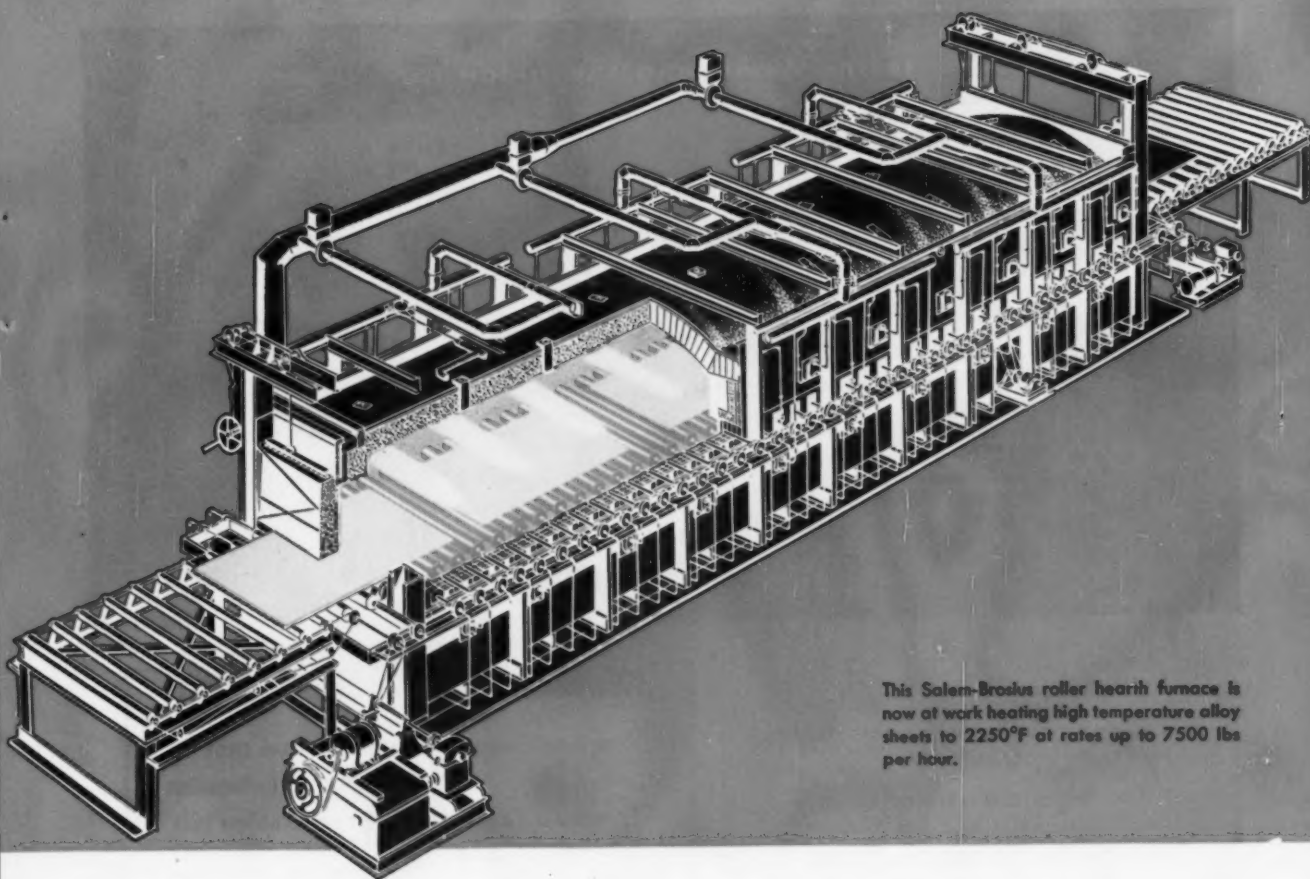
Sales in the first quarter were also off from first quarter 1957—\$181.5 million from \$208.6 million.

Inco Project Proceeds

The 10 pct cutback in production announced recently by International Nickel has not affected its big project in Manitoba.

Board chairman John F. Thompson told a shareholders meeting that the work, underway for 16 months, is proceeding on schedule. The project will begin production by 1960, the original target date.

Earnings statistics for the first quarter are not yet complete, said Mr. Thompson. But he said they would be "substantially lower" than the \$20.1 million earned in the last quarter 1957.



This Salem-Brosius roller hearth furnace is now at work heating high temperature alloy sheets to 2250°F at rates up to 7500 lbs per hour.

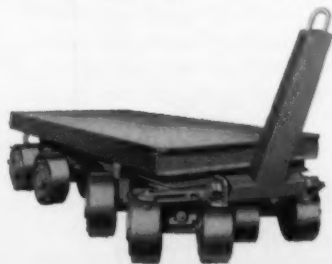
Top furnace for fast, accurate metal heating

This versatile roller hearth—a furnace design for which Salem-Brosius is well-known—gives you fast, automatic control of heating for a broad variety of shapes and types of mill products and metal parts.

Steel, brass, nickel, aluminum and other metals in sheets, plate, flat bars, tubes—even trays of small parts—are heated in this type of furnace. In the typical furnace shown above, sizes of slabs and plates heated

range from 40 x 71 inches to 58 x 95 inches.

Salem-Brosius has designed and built so many of these furnaces for such diverse applications that you can be sure of an installation to fit your needs exactly. Sound design and quality materials, plus precise temperature control will assure you of long, trouble-free economical operation. Write to Salem-Brosius for further information. There will be no obligation.



Salem-Brosius heavy-duty trailers (left) are ideal for handling in-plant loads of the same type of materials that are heated in the furnace shown above. Phil-Dumps—as shown at the right—are well suited to the handling, automatic dumping and storing of parts and bulk materials. They handle easily with a fork or platform lift truck.



SALEM-BROSIUS, INC.

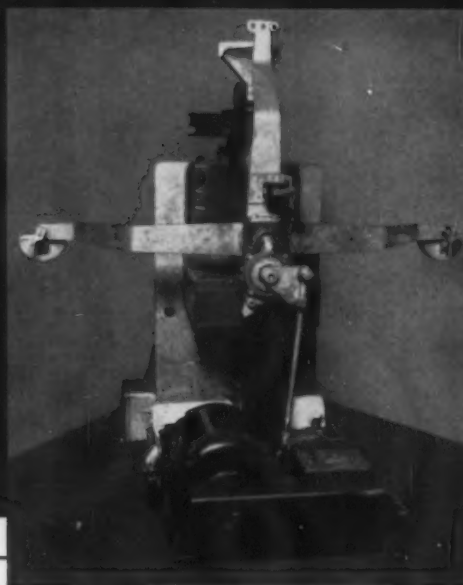
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The breakdown tester we use is shown herewith, and it's designed to separate the fact from the fiction.

After 100 passes through this tester, at 7200 r.p.m., we *know* how good our abrasives are and how long they will last.

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COMPARATIVE TEST REPORT

MATERIAL TESTED — 5660 CHILLED IRON SHOT

A - Cleveland Metal Abrasive B - Competitors C - Competitors

SCREEN ANALYSIS

U.S. No.	S.A.E. Spec.	A	B	C
8	0	0	0	0
10		35.5	54.0	36.0
12	85	60.3	36.2	48.0
14	12	4.2	7.7	14.0
Pan	3	0	1.1	2.0

CHEMICAL ANALYSIS

	A	B	C
T.C.	2.72	3.29	2.42
Si	1.13	1.36	1.20
Ph	.056	.380	.130
Mn	.40	.36	.47
S	128	.176	.141

Rc HARDNESS

	A	B	C
Low	58	59	57
High	62	65	62
Average	60	63	59

BREAKDOWN TEST

Thru U.S. No. 10 on U.S. No. 12 — No. of Grams Tested—100 — 100 Passes at 7200 R.P.M.

	A	B	C
12	0	0	0
14	2	0	.1
16	4	0	.5
18	4.8	.1	3.5
20	15.6	.2	9.4
25	24.4	7.9	20.7
30	13.5	8.4	12.1
35	9.9	10.6	11.5
40	4.1	11.3	6.0
45	2.7	7.1	4.6
50	2.0	14.2	3.4
Pan	13.7	27.6	17.8
Loss	8.7	12.6	10.4

Remarks — C.M.A. material best by test. *B.M.*

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Eugene L. Miller

He Challenges the Impossible

This energetic young executive has little room for "can't" in his vocabulary.

His policies at Cooper-Bessemer are making old timers stand up and take notice.

■ Gene Miller, 39, is the youngest president ever to head one of the nation's oldest metalworking firms—Cooper-Bessemer Corp., of Mt. Vernon, Ohio.

Taking over the firm's reins in a tough competitive climate such as exists today is a rugged test of executive mettle. During his first year in office, Mr. Miller has been busy resetting his company's business sights on the years ahead. A crucial part of his program centers on expansions in creative engineering and production at plants in Mt. Vernon and Grove City, Pa.

Can't to Can—Yesterday's impossibilities are becoming a part of daily schedules, Mr. Miller points out. The approach to these impossibilities is basically simple, he explains. Instead of trying to justify to customers why some jobs can't be done, the same engineering brains are spending the same time going out and doing them. Call it rushing in where angels fear to tread, but it's apparently working for Cooper-Bessemer.

To accomplish the impossible, Gene Miller is putting to use crash techniques he learned as an officer in the U. S. Army engineers. The technique consists basically of applying a "time-and-talent" evaluation to what must be accomplished and when.

Provides the Spark—Then it becomes a management factor of working back to assemble the human energies it takes to get the job



GENE MILLER: A matter of time and talent.

done. This same technique which Mr. Miller once used to build front-line military airstrips is inspiring a new philosophy for anticipating the needs of the nation's growth industries.

With engineering talent the creative heart of Cooper-Bessemer's heavy engine and compressor business, Gene Miller supplies the organizational enthusiasm.

Company Response—Some of the older hands at Cooper-Bessemer describe his market and product development tactics as "jumping out of an airplane without a parachute." But he hopes to teach them how to land safely, and on both feet.

Says Board Chairman Lawrence

Williams, who moved upstairs last year when Mr. Miller took over the president's suite: "Where the company is going and how fast is entirely up to the 'Boss' and his bright young men. But in the meantime, the rest of us who have been here a little longer hope we can get used to jumping out of airplanes like these guys are doing."

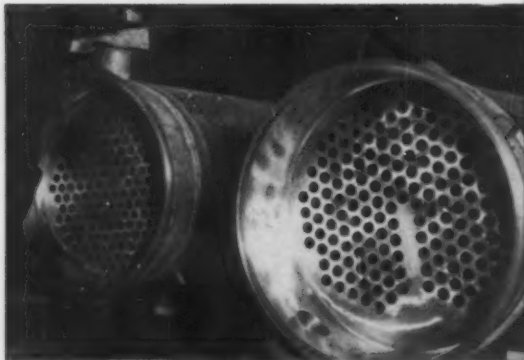
One of the goals Cooper-Bessemer management has in mind: Doubling the company's size in the next 10 years. Behind Gene Miller's leadership they see themselves as a dedicated group of men in a race against time for the chemical, missile, steel, and electronic industries Cooper-Bessemer serves.



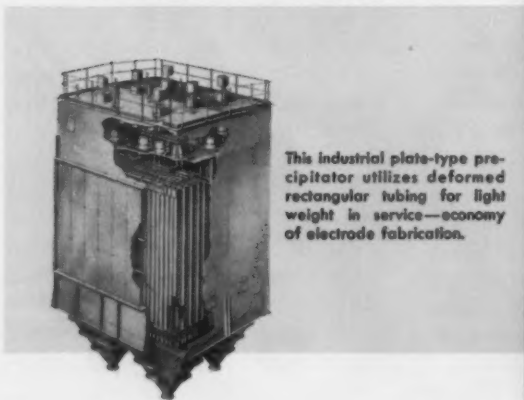
Sea water evaporators capable of producing 30,000 gallons of fresh water daily depend on welded stainless steel tubing for corrosion resistance.



The casings and plugs in this sodium reactor core are welded stainless steel tubing to insure corrosion resistance and uniform fit.



The ductility of welded steel tubing for rolling-in, plus reliable corrosion resistance and durability are added advantages in this heat exchanger.



This industrial plate-type precipitator utilizes deformed rectangular tubing for light weight in service—economy of electrode fabrication.

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Industry Gets a Public Hearing

Recession provides an opportunity to show how restraints on business have hurt the economy.

General public, unsympathetic in boom times, may now see industry's side. It could result in some relief.

■ There may be one good result of the current depression. It could bring relief to industry from some of the problems and restraints that have been hampering it for some time.

Industry has called for help from Congress and has asked for public support before. But these calls in recent boom years fell on deaf or unsympathetic ears. The reaction, in good times: Why worry, as long as profits continue.

Would Have Helped—It's doubtful if Congress is going to admit that it was short-sighted, that some action a year or two ago would have prevented or cut the severity of the present downtrend.

But depressed conditions today do provide an effective background for stating the case. Congress and the public, sincerely confused by the sad state of business, are in a mood to listen.

What Could Happen—These are some of the things that could happen:

For years the auto industry (and others) has complained about the unreasonableness of a 10 pct excise tax, and its restraining effect on auto sales.

Now, the excise tax may get some serious consideration, with possibility of a new tax enacted that is based on national conditions today, not World War II.

Intelligent Depreciation—Makers

of capital goods have cried out consistently that antiquated depreciation measures were out of date, that they discourage and prevent industry from making necessary capital goods expenditures.

Now, perhaps Congress will take a realistic look at depreciation and enact measures in keeping with the needs of modern industry.

For years industry has complained about the inflationary demands of Big Labor. But with no public support, and even urging from the government, it had little choice but to yield point after point.

Stiff With Labor — Now, with wage costs going higher in a period

of severe economic recession, and bringing higher costs with them, the demands of labor stand out in bold relief. Inflationary demands are getting short shrift.

Even the much-maligned railroads are coming in for some sympathetic treatment. Instead of being brushed aside, the roads are getting serious consideration about rates, equipment financing, and other points. These are just a few.

Industry can't win them all, but if it is ever to get sympathetic treatment, now is the time. It's up to you to see that your industry group is getting its fair shake. Others are.

Unions Fight "Ability to Pay"

If your company has a labor contract to negotiate this year, here are a couple of points to keep in mind:

Whether they admit it or not, unions are taking financial condition of the firm into serious consideration. They know they have to.

Not Always Easy — But don't just tell the union you can't afford to grant a raise this year and expect it to play dead. This is the very kind of thing the unions are warning their memberships against, and they are doing their best to give them ammunition to fight financial arguments.

The current "Collective Bargaining Report" of the AFL-CIO examines the ability to pay basis of negotiating. Principally, it warns against accepting that argument without a struggle, and advises what loopholes to look for in the management argument.

Guiding Questions — It supplies negotiators with these three questions as guides:

1. Are there more desirable ways of aiding the company than limiting or passing up wage increases?

2. Are wages a key element in the company's financial structure picture?

3. What effect is a substandard wage settlement likely to have on the union's negotiations elsewhere?

4. Have past settlements been so small . . . that it is intolerable to accept another substandard settlement?

The report goes into detail advising negotiators how to study financial reports and statements, what to look for, and arguments against accepting them on face value.

If you are in the position of using financial arguments this year, come prepared. The union will. And it won't give in easily.

Auto Profits Take a Nosedive

And UAW Profit Sharing Hopes Ride With Them

Substantial drops in first quarter net earnings are reported by Ford and GM.

Chrysler is in the red, so is the union. Only AMC forges ahead.—By H. R. Neal.

■ Profit sharing, as a 1958 UAW contract demand, has become an academic question. Auto company financial reports covering the first quarter reveal there will be relatively little in the pot for the com-

panies, much less a surplus for the workers.

General Motors is holding up the best of the Big Three. Yet its first quarter dollar sales dropped to \$2.72 billion, 11.6 pct below the \$3.08 billion reported a year ago. Net income fell at an even greater rate than sales — despite higher prices charged for 1958 products. First quarter profits of \$185 million after taxes, are off 29 pct from \$261 million in the 1957 first quarter.

Chrysler in Red—Ford reported its sales in the first quarter of 1958 amounted to just under \$1.1 billion, 30.2 pct less than the \$1.57 billion recorded for the same quarter a year ago. Net earnings fell to \$22.7 million, from more than \$100 million last year.

Chrysler dollar sales plunged 53 pct below the \$1.15 billion total achieved in the 1957 quarter to \$537 million. The previous year's lusty \$46.5 million profit for the quarter evaporated entirely this year: the firm reported a net loss of \$15 million.

AMC Prospers—Not all of the reports are bleak. American Motors boosted sales to \$113.8 million in the quarter, second of its fiscal year. A year ago its sales for the period were \$98 million. A March quarter loss in 1957 was turned into a \$2.4 million profit this year.

GM, in its report, noted its first quarter unit sales of cars and trucks totaled 780,941 vehicles, or 17 pct under the 944,078 units for the corresponding period last year. But, the report pointed out, the decline "compares with a 29 pct decrease for the total U. S. automobile industry."

Foreign Operations—GM's Canadian sales remained about equal to the 1957 quarter, but its overseas sales jumped sharply. Principally involved are increased sales of its German-built Opel, English-built Vauxhall and Australian-built Holden. Overseas sales climbed to 147,966 units from 98,597. Even so, relatively few Opel or Vauxhall cars, now being imported to this country, have found their way to the American market place.

Ford's factory sales of cars and

New Thunderbird Flaps Its Wings



SUMMER ATTRACTION: Ford Div. this week introduced its 1958 Thunderbird four-passenger convertible. Top photo shows deck lid open and cloth top being raised. When roof is in place and deck lid closed, lower photo, car presents the familiar lines of the Thunderbird hardtop.



Welding reduces bridge costs

Calvert Iron Works, a leading bridge builder in the Southeast, reports reducing construction costs by using arc welding instead of riveting. New techniques and improved electrodes have made welding a practical and more economical means for fabrication.

New M&T "Murex" electrodes help make the difference. Calvert considers them best for their work, reducing welding time and practically eliminating X-ray rejects. Information about these and more than 1000 other types and sizes of Murex electrodes are given in catalog ESC, available on request.

It costs little to guard working parts

To millions everywhere, SINGER stands for quality in sewing machines. One doesn't "toy" with such a reputation. So, daughter's machine gets many of the fine construction details found in mother's. Working parts for both get extra resistance to wear and corrosion with Unichrome SRHS[®] Chromium plating.

Literally hundreds of thousands of small parts are quality finished each day at minimum cost — a feat made feasible because of the self-regulated high speed operation of the bath; and the Unichrome Chromium Plating Barrel, the first successful production equipment of its type. Send for data on both.



Vinyl coating stands rough abuse

Products coated with Unichrome Plastisol can be dropped, bumped, exposed to acids, alkalies and other corrosives — all without damage to the finish.

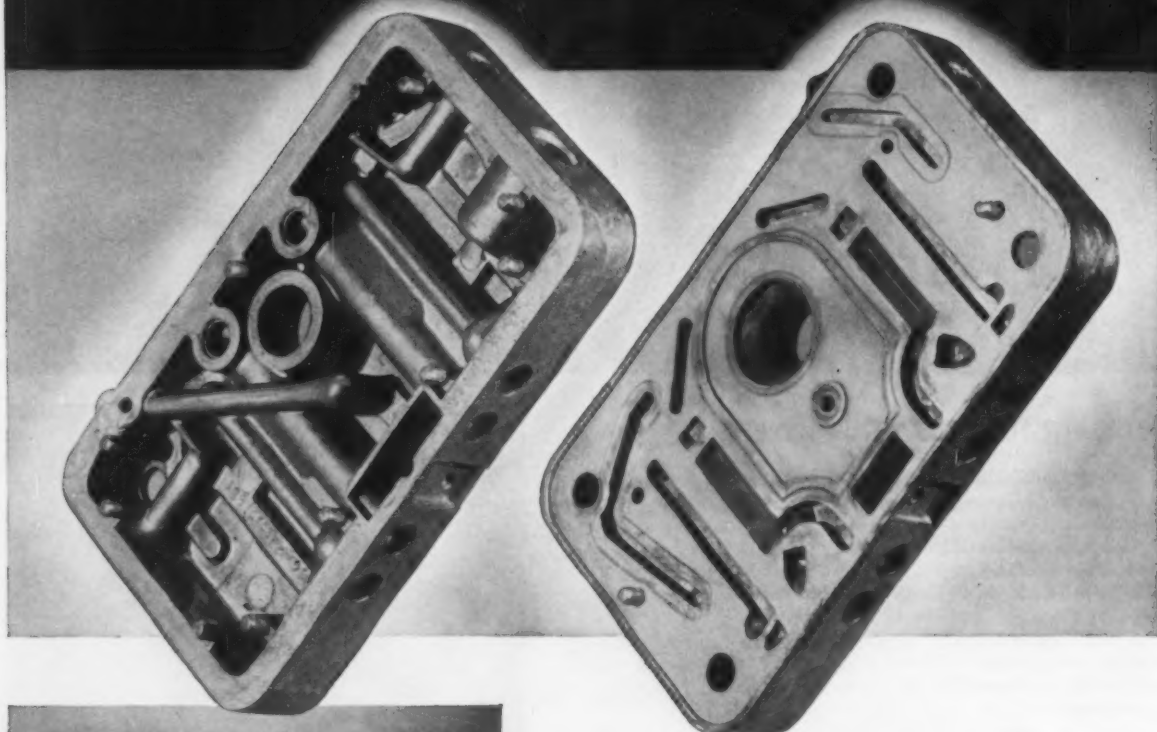
Unichrome Plastisols are vinyl compounds that form a tough, seamless, resilient, protective thick skin. Coating won't chip, crack, tear, peel, scuff or blister; can be applied to products of bakeable size by spray, dip and other methods. Send for Bulletin VP-3.



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14 ZINC Die Castings make up principal components of the Holley four-barrel downdraft carburetor.



Holley Carburetor Co. has these exacting metering bodies as well as 12 other principal parts of the Model 4150 carburetor made of ZINC because ZINC Die Castings are best suited for the job. Extreme complexity of shape of all these components, close tolerances of the air and fuel passages in the metering bodies and rigid efficiency requirements of the product demand the accuracy, strength, reliability and economy of ZINC Die Castings.

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Automotive Production

WEEK ENDING	CARS	TRUCKS
May 3, 1958*	79,661	18,007
April 26, 1958	58,664	16,204
May 4, 1957	119,999	23,849
April 27, 1957	123,633	24,625
TO DATE 1958	1,588,200	309,800
TO DATE 1957	2,410,000	397,000

*Preliminary

Source: Ward's Reports

trucks in the first three months of 1958 totaled 400,419 units. This is 36 pct less than the 626,206 units sold in the first three months of 1957. Contributing little to the sales total: Edsel, with factory sales of only 5519 cars. When introduced last August, Edsel's sales goal was placed at 200,000 units for the first year, 10 times the current indicated selling rate.

Finis for Fins—Like Icarus, who flew high on wax wings only to have them melted by the sun, causing him to plunge into the sea, the magic of Chrysler's fins seems to have melted. Factory sales of vehicles fell to 185,888 units, compared with 420,880 units a year ago.

Only American Motors has cause for joy over its sales showing. While a second quarter breakdown was not available, AMC said sales in the first six months of its fiscal year totaled 71,264 units, about 70 pct greater than the 41,936 units sold in the same period a year ago.

S-P Hopeful—Studebaker-Packard hasn't announced its first quarter report, but it's bound to be gloomy. Production for the year to date is only about 16,500 cars and trucks compared with about 28,500 through April last year. However, the firm has sounded two optimistic notes. S-P's sales have increased slowly but steadily in the past two months.

S-P also announced plans to introduce a new lower-cost car this year. The firm said "It will be lower cost, yet well made transportation that retains full-sized passenger space for comfort, safety, and more economical operating cost."

Union Income Falls—The automakers weren't the only ones to feel the pinch at the pocketbook. The industry's labor brokerage house, the UAW, has also felt the impact of low auto sales. Dues-paying membership is off an estimated 400,000 from last year's 1,300,000 members.

The union reportedly is running \$200,000 a month into the red. Top union executives are slated to take a 10 pct pay cut for the next three months. Further economies will be made through a layoff of 100 staff members not represented by any bargaining unit.

Office workers at Solidarity House, the union's headquarters, are in the midst of bargaining for a new contract. They are said to be making the same demands against the International, minus profit sharing, that the union is making against the auto companies.

New Chrysler Plant

First shipments of the 13,000 tons of structural steel for Chrysler

Corp.'s new St. Louis automobile assembly plant have arrived at the 225-acre plant site.

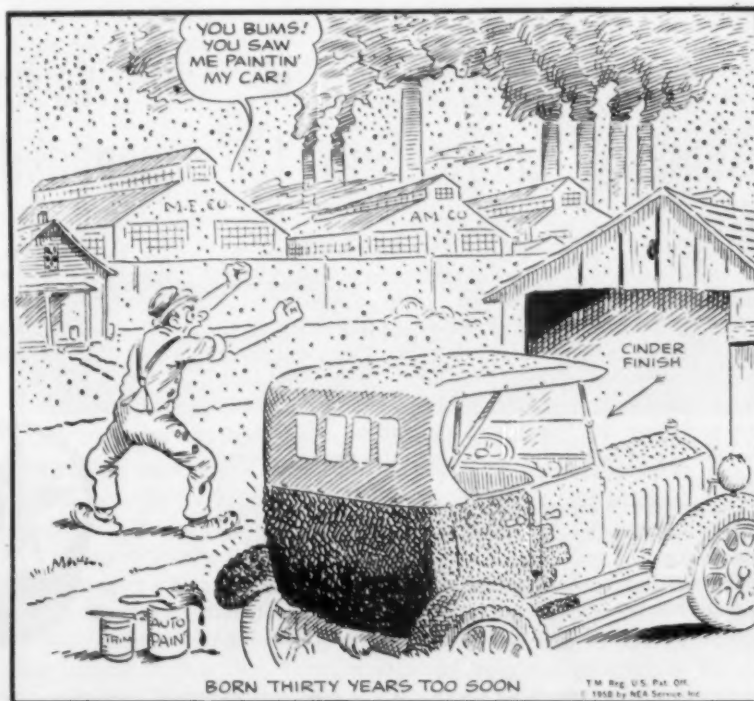
Chrysler said the 35-acre automobile assembly area should be under roof by mid-year. More than 400 contractor employees are now working on construction. Crews will speed construction by working from the east and west ends of the building toward the center, rather than following the usual procedure of working from one side.

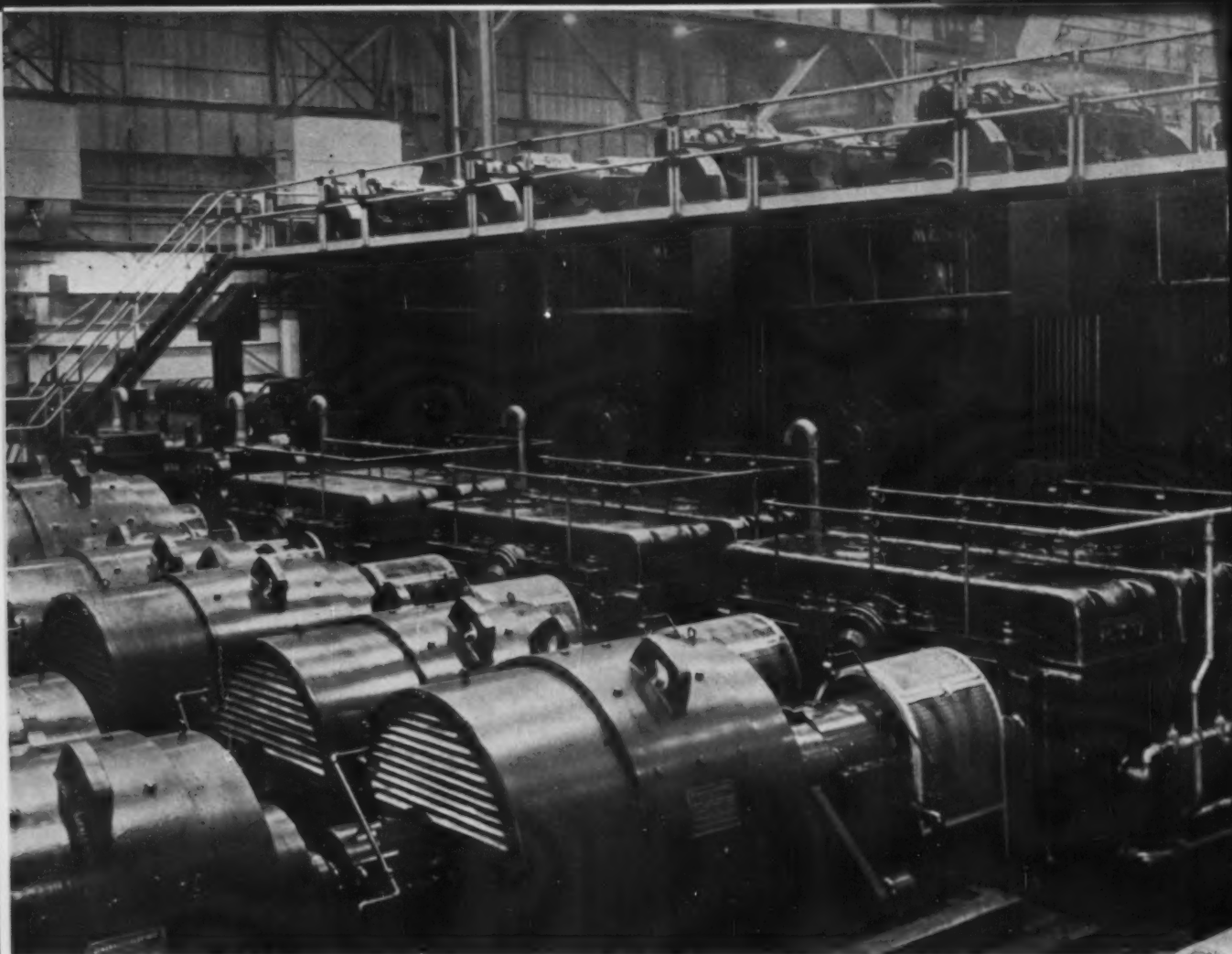
Price Tags Urged

Executives from the automobile industry have told a Senate subcommittee on automobile marketing practices their companies endorse proposed legislation requiring labeling of new cars with the manufacturer's suggested retail delivered price.

The bill is aimed at dispelling confusion on the part of consumers and eliminating such practices as price packing, false and misleading advertising, and new car bootlegging.

THE BULL OF THE WOODS





Additives in Texaco Meropa give heavy duty gears "Boundary Lubrication" for dependability under pressure

To fully protect your reduction gears, use the lubricant that *keeps on lubricating* even under extreme shock and continued heavy loads—Texaco Meropa Lubricant.

In addition to its extreme pressure properties which cushion the gear teeth, Texaco Meropa Lubricant contains special *polar* additives that cling to the metal and prevent the lubricating film from being squeezed out—thus providing the "boundary lubrication" so vital to the long life of heavy duty gears operating under heavy pressures.

The result is increased gear life, minimum wear, and reduced maintenance costs when you use Texaco Meropa Lubricant.

The full line of Texaco Meropa Lubricants exceeds all requirements of main drive units and other steel mill machinery. Your highly qualified Texaco Lubrication

Engineer will be glad to suggest the right one for your operating conditions. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.



LUBRICATION IS A MAJOR FACTOR IN COST CONTROL
(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

Individual Tax Cuts Fade Away

But Corporate, Excise Taxes May Get a Break

In spite of the public clamor, there is little possibility of individual tax cuts this year.

Tax most likely to be cut is the 10 pct excise on autos. It's believed a cut here would help spending.—By G. H. Baker.

■ The possibility of tax cuts for individuals this year is fading fast. Congressional leaders have reached agreement with the White House and the Treasury to drop earlier plans for easing the load on individual taxpayers.

But incorporated business and automobile makers may still get a tax break. Government revenue experts have been meeting behind closed doors at the Capitol on plans for relief. Present political thinking is along these lines: A drop of perhaps 3 or 4 percentage points from the present rate of 52 pct on income of incorporated firms; a drop of 3 percentage points from the present rate of 10 pct on the manufacturers' price of each new car.

Have to Act—Some kind of tax bill this year is essential. Unless the Congress acts to forestall the automatic drops in rates prescribed by law last year, the rate on incorporated income will drop from 52 pct to 47 pct, and the automobile excise tax will drop from 10 pct to 7 pct.

It's always possible, of course, that the Congress will do nothing and permit the lower rates to take effect automatically on June 30. But this is not probable.

Break for Autos—The tax experts are virtually agreed on some reduction in the auto excise tax. A

reduction of 5 percentage points will spell a difference of about \$150 on a \$3000 car, and it's believed that this kind of saving will stir up some retail sales.

Congress Cools On Foreign Aid

U. S. foreign aid in the new fiscal year (starting July 1) is to be considerably below what the Eisenhower Administration is asking. Ike wants about \$3.9 billion for U. S. allies in the year ahead. But it

looks like Congress will approve only about \$3.5 billion—down by nearly half a billion dollars from what the State Dept. says is "essential."

Trouble is, Congress is waking up to the fact that what the State Dept. says is "essential" isn't necessarily so. Documented reports of waste in the foreign aid program are turning up all over the globe. Point is, even \$3.5 billion is a plump total that will take care of just about every trouble spot outside the United States.

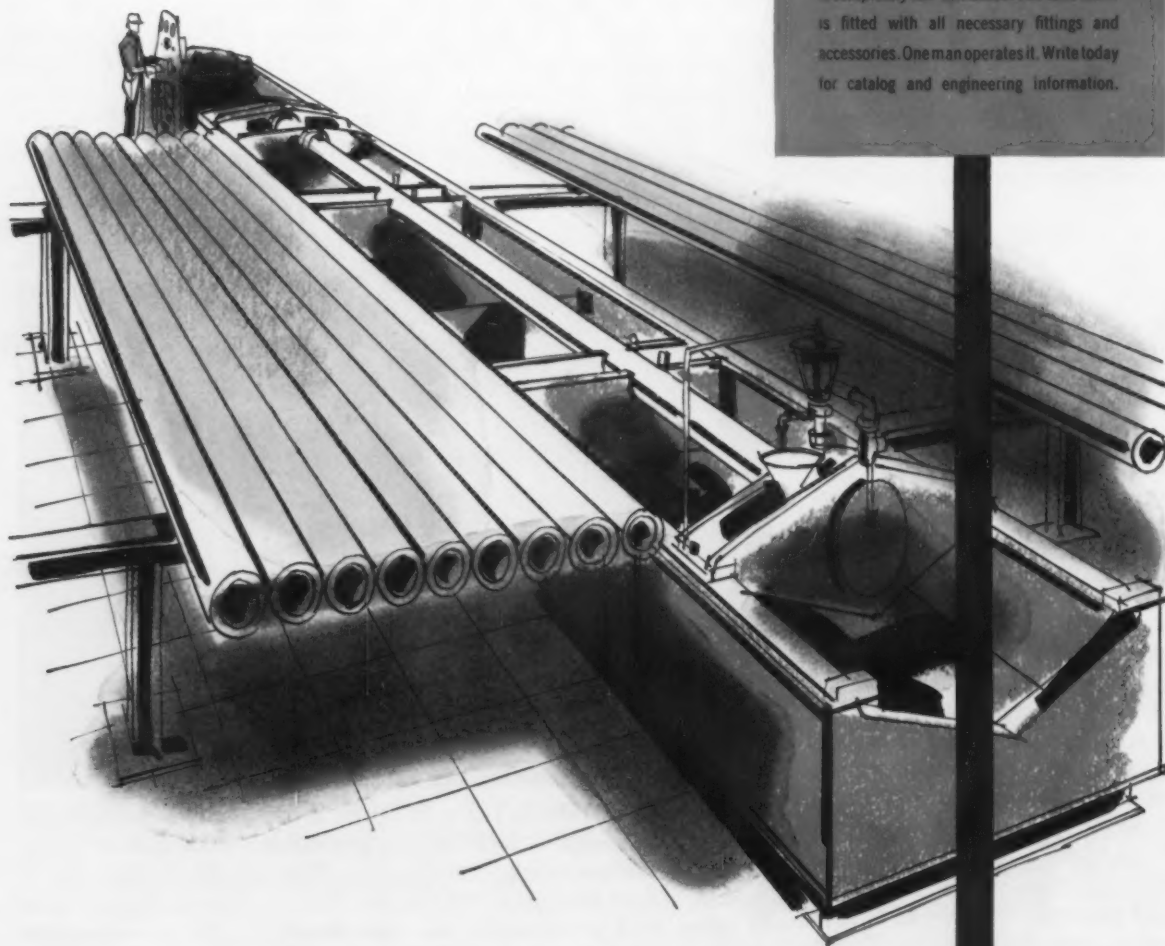
Key Figures in the Nicaro "Look"



BEFORE THE STORM: The main figures in the House Government Operations Subcommittee's "look" into the government's nickel plant at Nicaro, Cuba, pose before entering the chamber. They are left to right, Ira D. Beynon, special assistant to the General Services Administrator; Franklin G. Floete, GSA administrator; Rep. Jack Brooks (D., Tex.), subcommittee chairman; and Langbourne M. Williams, president, Freeport Sulphur Co. Inside the smiles disappeared. Mr. Beynon complained bitterly that Mr. Williams had an investigator probing his private life. Rep. Brooks questioned the fairness of the price Freeport received from the government for ore for Nicaro. The Freeport president presented a sturdy defense on both.

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R. D. Wood Hydrostatic Tube Testing Machine for tubes of $4\frac{1}{2}$ " to 12" diameter nominal sizes and in maximum lengths of 35'-0" at hydrostatic test pressures from 700 to 1500 psi. Resistance head can be adjusted for testing shorter lengths. Unit is completely self-contained. The tube tester is fitted with all necessary fittings and accessories. One man operates it. Write today for catalog and engineering information.

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Why Portland Attracts Industry

Metalworking Firms Discover Its Advantages

Industries, whether locating in the Pacific Northwest or expanding, find Portland has a lot to offer.

It's an excellent distribution center, has ample supplies of power.—By R. R. Kay.

■ Portland's strength as an industrial center in the Pacific Northwest continues to increase.

Metals firms are contributing heavily to the city's growth. Many metalworking companies have located in the area or expanded existing facilities in the last two years.

Distribution Center—In 1957, for example, new shops were opened for industrial chrome plating, metal roll slitting, welding rods, electric transformers, and electronic instruments. Here are some of them: American Pipe & Construction Co., Electric Steel Foundry Co., and Reynolds Metals Co.

But this inland harbor city, some 90 miles up the Columbia River from its Pacific Ocean mouth, has more to offer. Every day its importance swells as a warehousing and distribution center. Big-name national firms have poured millions of dollars into facilities there. Some who added space are Blake, Moffit & Towne; Firestone Tire & Rubber; Truck & Coach Div. of General Motors; General Tire & Rubber Co.; and B. F. Goodrich Co.

Plenty of Power—Power is no drawback in Portland. Hydro-electricity is ample. And now industry can use natural gas. This fuel has been coming in since late in 1956. Portland Gas & Coke Co. continues to extend its service area.

Other utilities and railroads have big plans under way. Some \$35 million will be spent by Pacific Power & Light, Pacific Telephone & Telegraph, Portland Gas & Coke, Portland General Electric, and the Union Pacific Railroad.

Jet Tankers Coming

Boeing Airplane has a \$202 million contract for 130 KC-135 jet tanker-transport. The new contract will carry production at the com-

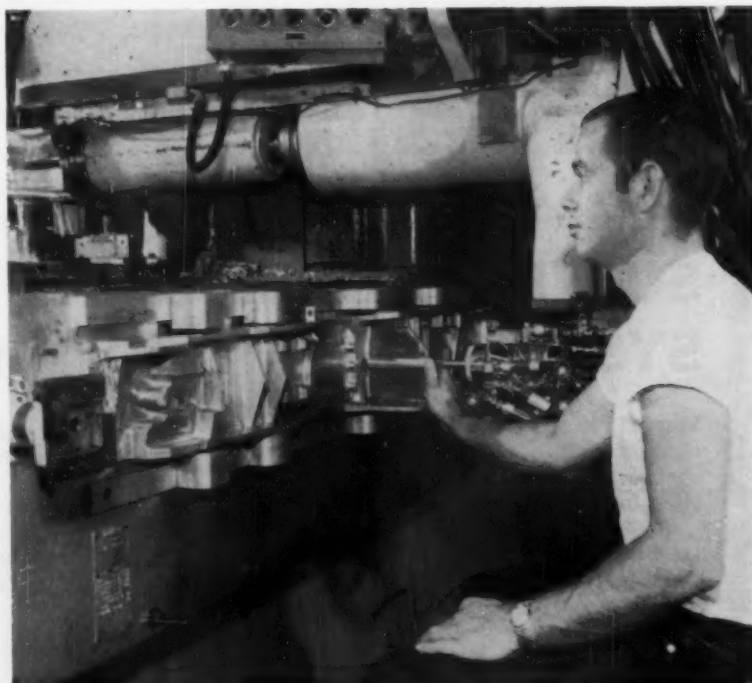
pany's Renton, Wash., plant through 1959.

Space Engineer Search

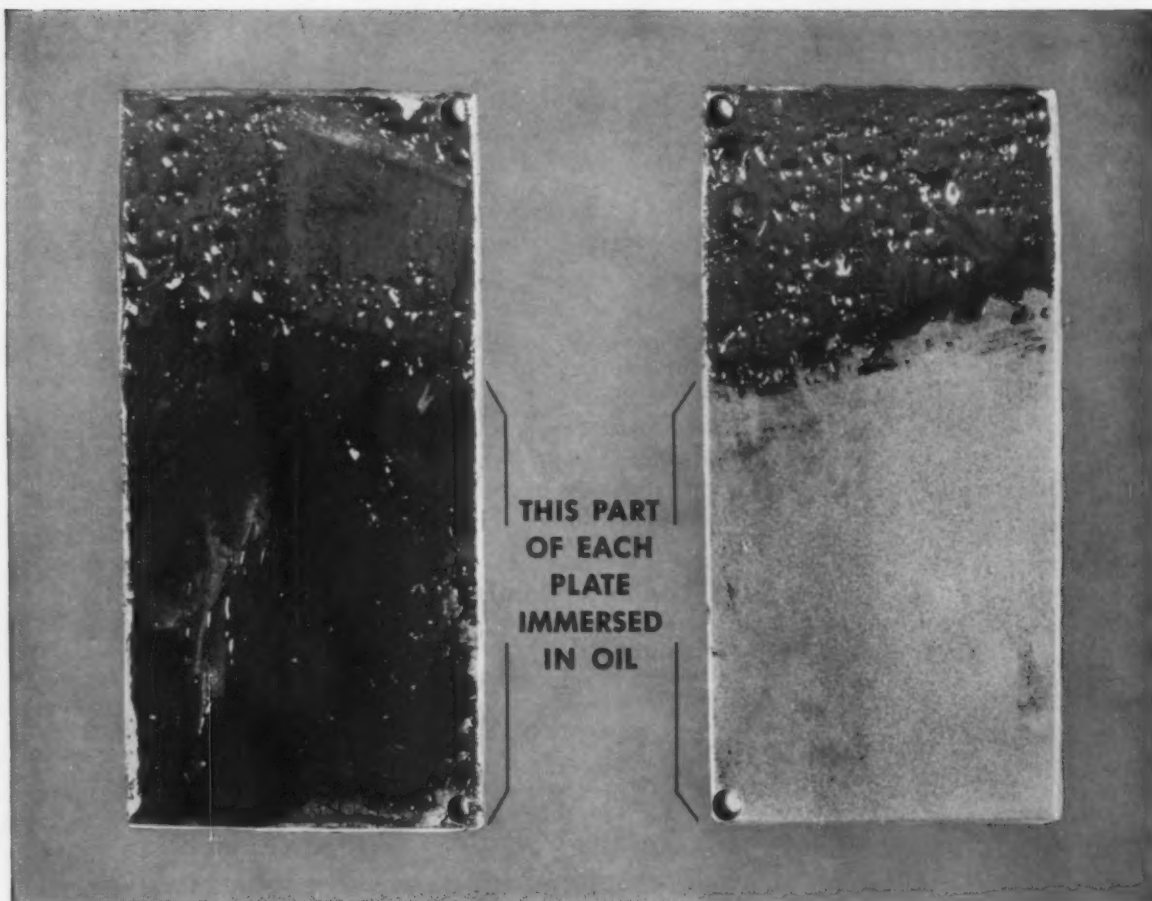
Watch out for space-age raids on your engineering personnel. Some aircraft and missile manufacturers are stepping up attempts to recruit hundreds of engineers.

One firm, Boeing, says its increased missile and space vehicle type work creates "an immediate demand" for more than 1000 engineers in Seattle alone.

How to Make the Complex Less Difficult



ARTIST AT WORK: Machinist at North American Aviation mills cavity into workpiece by following machining pattern with stylus. Equipment, developed by North American, saves handling and tooling time in making scores of complex cuts on front spars of F-100 Super Sabre.



This sludge-coated metal plate was partially immersed in a beaker containing a *regular hydraulic oil* heated to normal operating temperature. Though the oil was agitated throughout the test, nearly all the sludge remained on the plate.

This similarly sludge-coated plate was partly immersed in a **SUNVIS 700** oil, also heated to normal operating temperature. During the same period, with the same degree of oil agitation, the immersed part of the plate was rinsed clean of sludge.

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Super-Electrified Tools Coming

Power Stepup Will Improve Tomorrow's Machines

The age of "electromotion" in machining is on the way, speakers at Westinghouse forum predict.

Worker productivity expected to increase with use of more automatic tools packing more power.—By E. J. Egan, Jr.

■ A picture of what machine tools and machining will be like 10 years from now is starting to take shape. Some bold new brush strokes have just been daubed in by speakers at Westinghouse Electric Corp.'s 22nd Annual Machine Tool Electrification Forum.

Electric power, applied in huge quantities and in new ways, will underlie many of the improvements in metal cutting tools and techniques.

More for More—The need for increased power is unmistakable, according to K. M. Patterson, Westinghouse industrial sales manager. He told Forum participants that the U. S. work force is shrinking steadily, but it must somehow meet demands for goods and services from a population that's growing by more than 10,000 people daily.

The only solution is to increase worker productivity, Mr. Patterson maintains, and to do it with more automatic machines and more electric power. He sees a fast approaching era of super-electrified machine tools, and he's coined a term to describe it: "Electromotion."

Higher Speeds and Ratings—All plants that intend to do any machining in the 1960s are going to have to power up 'way beyond present levels, Mr. Patterson warns. And technical papers read at the Forum leave

no doubt that tomorrow's machines will be revved up to much higher speeds and horsepower ratings.

But electric power will serve the goal of more efficient machining in other ways, too. For example, it seems clear that static control devices—silent, reliable units with no moving parts—will take over more and more current switching jobs from conventional circuit components.

Cutting on Camera—You'll also see closed-circuit TV cameras and viewing screens built into more of the bigger machine tools. Object: Better control of cutting tools at locations far from the operator's console. And numerical control of machine and tool motion, still a hazy concept to many production

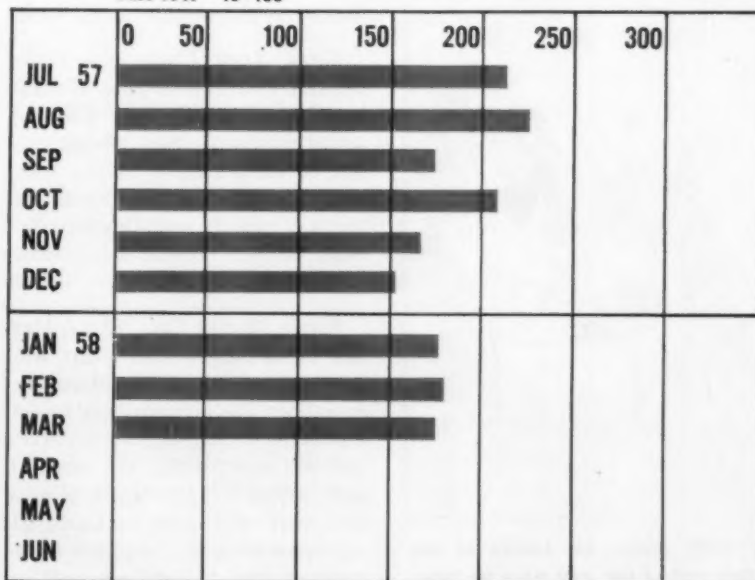
men, will shove ahead to acceptance.

Reliability Stressed—In Philadelphia, a few more lines were painted into tomorrow's machining picture as the ASTE Show and Annual Meeting got underway. Addressing an opening-day luncheon, H. Thomas Hallowell, Jr., president of Standard Pressed Steel Co., echoed the Westinghouse Forum theme, called for a near 100 pct increase in productivity in the next 10 years.

Production line thinking that allows up to 4 pct defective parts is primarily concerned with the initial cost factors, Hallowell charged, and not with end-product performance. This is one reason why the U. S. consumer gets stuck with a multi-billion dollar repair and servicing bill each year, he asserted.

GEAR INDEX 1957/1958

Base 1947—49=100



Source: American Gear Manufacturers Assn.

INDUSTRIAL BRIEFS

Alloys for Space — Allegheny Ludlum Steel Corp. has developed two new high-temperature alloys for use in the jet and missile age. Designated D-979 and Af-71, these alloys were developed in the Research Laboratory at the Watervliet, N. Y. Works, and have been produced in billets, bars, sheet, wire and forgings.

A Lift for Lukens — Linde Co., Div. of Union Carbide Corp., will build an automatically-operated oxygen plant at Lukens Steel Co., Coatesville, Pa. Scheduled to go on-stream in Jan., 1959, the supply system will be capable of producing high-purity gaseous oxygen at a maximum rate of at least 80 million cu ft a month.

Know Your Conveyors — "Conveyor Terms and Definitions, Book No. 101" has been published by the Conveyor Equipment Manufacturers Assn. as an up-to-date and enlarged edition of an earlier publication. The 96-page book, selling for \$2, defines more than twelve hundred conveyors types, parts, and related equipment.



"He's telling his buddy at the other end of the mill what he takes in his coffee."

Big Piping Job — Dravo Corp., Pittsburgh, has contracted to supply West Penn Power Co. all piping for a new 156,000 kw steam turbine. The unit is the second to be installed at the company's Armstrong Station at Reesdale, near Kittanning, Pa.

Foil For Transformers — Aluminum Co. of America, Pittsburgh, has purchased the Transformer Div. of Automation Instruments, Inc., at Boulder, Colo., along with all technical data and research and development equipment. Alcoa's market objective is the application of aluminum foil and sheet strip windings for transformers and other electrical equipment.

Power For Trujillo — Westinghouse Electric International Co. will build a \$3 million power plant for the electrical needs of Ciudad Trujillo, capital of the Dominican Republic. Equipment will be manufactured at the Lester, Sharon, and E. Pittsburgh, Pa. plants.

Atomic Pellets — Nuclear fuel pellets are being made from uranium powder at Westinghouse Electric Corp.'s metals plant, Blairsville, Pa. They will be used by the company's Atomic Power Dept., which specializes in engineering, design, and sale of commercial power reactors.

Foote Tech Center — Foote Mineral Co., Philadelphia, is making plans to build a new technical center next year. New laboratories will be erected on a 54-acre tract near Exton, Pa. It will house the firm's Research and Development Dept. and the Central Engineering Dept.

Bigger Market Cut — The Atkins Saw Div., Borg-Warner Corp. will double its Portland manufacturing operation. The company has leased a building at 337 N. E. 10th Ave. and will move within the next 30 days. About \$75,000 worth of new equipment and close to \$100,000 additional stock will be added. Most products for the West Coast will be manufactured in Portland.

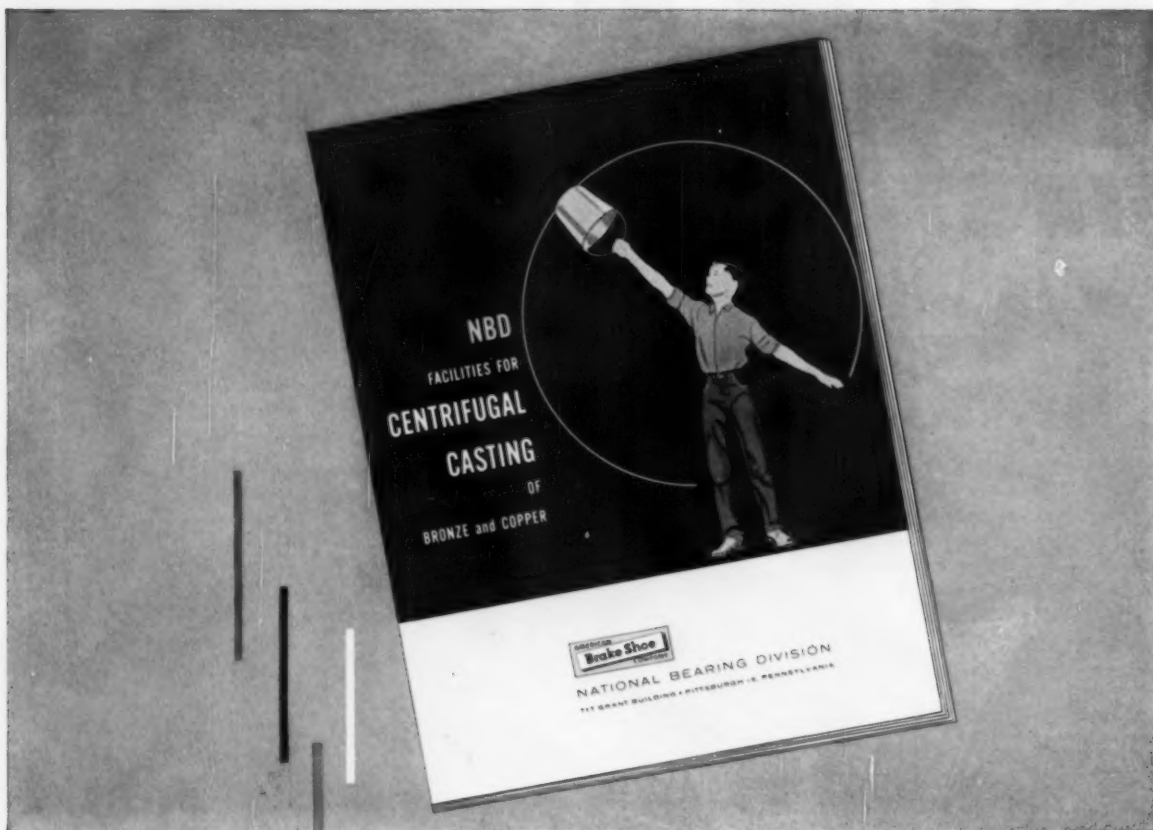
Military Maneuver — The Singer Mfg. Co., New York, has formed a Military Products Div. The division was created to develop and produce electronic and electro-mechanical equipment for the defense industries and the Armed Forces, with special interest in the missile and space fields.

Real Estate for Norton — Norton Co., Worcester, Mass., has purchased 120 acres of land in Piqua, O. The site was first viewed in Oct. 1956 and has been one of many under consideration during the past 18 months. It is an excellent spot and a logical location for a distribution center. No definite plans for this property have been made for the future.

Foil by Six Feet — One of the widest — 72 in. — aluminum foil mills is in operation at the Ravenswood, W. Va., works of Kaiser Aluminum & Chemical Corp. The mill has a 72-in. separator and three annealing furnaces as auxiliary equipment. Installation has been completed on the separator. The mill will also provide up to 66-in. widths of foil for laminators in operation at its nearby Belpre, O. plant.

Rockwell Honored — A \$2.5 million building which will house the Law and Business Administration Schools of Duquesne University has been named "Rockwell Hall," honoring Col. W. F. Rockwell, board chairman of Rockwell Mfg. Co. and Rockwell Spring & Axle Co. He has been chairman of the President's Advisory Board at Duquesne since 1952. The building is the third to be added to the University as part of a \$20 million expansion program.

More Brightwork — The Serrick Corp., Defiance, O., is building a new finished metal products plant at Cullman, Ala. It will be known as Cullman Products Div. of Serrick Corp. and will be in production this fall. The division will manufacture stainless steel and aluminum decorative mouldings for automobiles and appliances.



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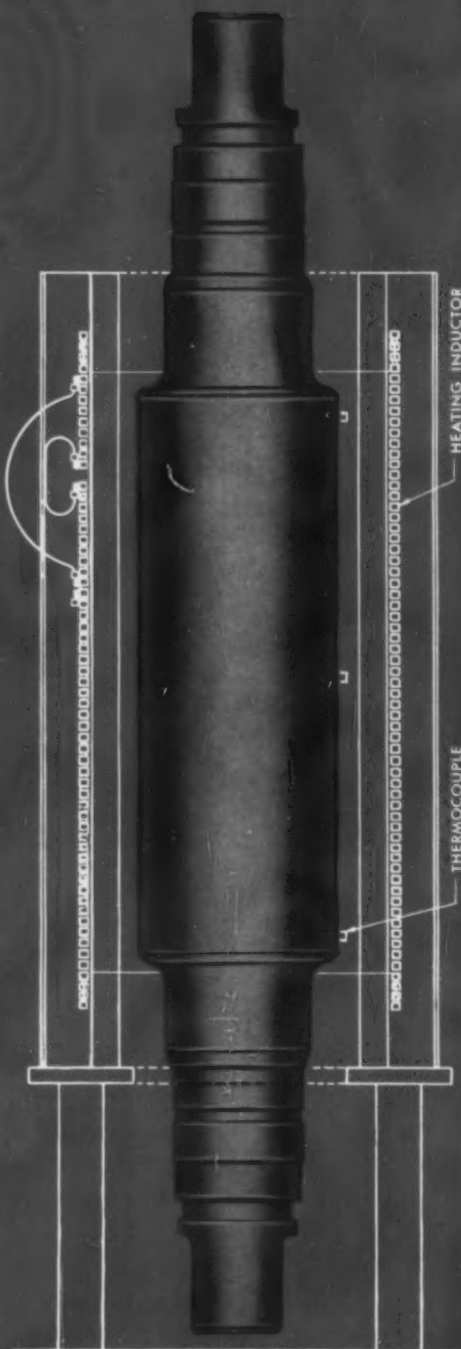
LIMA, OHIO

Plants at Lima and Springfield, Ohio

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MEN IN METALWORKING

P. T. Egbert, elected chairman of the board, Alco Products, Inc., New York; **W. S. Morris**, elected president.

R. R. Eppert, named president, Burroughs Corp., Detroit.

F. J. Fields, appointed president, The Fosdick Machine Tool Co., Cincinnati.

Arie Vernes, elected president, Philips Electronics, Inc., New York.

K. M. Gleszer, elected president, Dixon Sintaloy, Inc., Stamford, Conn.

Austin Goodyear, elected president, Hewitt-Robins, Inc., Stamford, Conn.



C. J. Parkinson, elected vice president, The Anaconda Co.

W. M. Taylor, named asst. to the vice president, sales, and manager of marketing, F. J. Stokes Corp., Philadelphia.

J. C. Mallory, appointed asst. manager, Sheet Sales Div., Wheeling Steel Corp.

H. M. Walton Jr., appointed Baltimore branch sales manager, Aluminum Div., Olin Mathieson Chemical Corp.

R. A. Lowe, appointed sales manager, Baldwin-Lima-Hamilton SR-4 Products Group.

V. C. O'Hara, appointed credit manager, Chicago district office, American Steel & Wire Div., U. S. Steel Corp., Chicago.



C. E. Weed, elected chairman of the board and chief executive officer, The Anaconda Co., Chile Copper Co., Chile Exploration Co. and Andes Copper Mining Co.

S. G. Oppenheim, named vice president and general manager, W. S. Rockwell Co., Fairfield, Conn.

Arthur Freed, named vice president, marketing, Servo Corp. of America, New Hyde Park, N. Y.

A. K. Boszhardt, appointed supervisor, crushing machinery sales, Allis-Chalmers Processing Machinery Dept.



Carl Claus, elected vice president, The Babcock & Wilcox Co., New York.

Philip Levin, named executive vice president, Thermal Reduction Corp., Philadelphia.



C. M. Brinckerhoff, elected president and director, The Anaconda Co., and president of Chile Copper Co., Chile Exploration Co., and Andes Copper Mining Co.

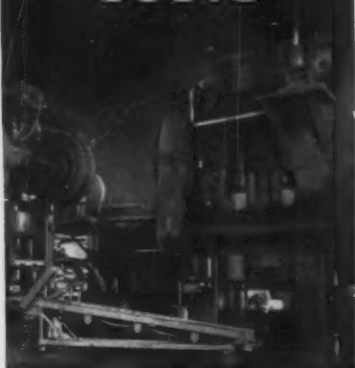
W. S. Ramseur, appointed southeast regional sales manager, Bryant Mfg. Co., Birmingham, Ala. headquarters.



J. D. Mackenzie, elected president, American Smelting & Refining Co.

C. W. Baker, promoted to asst. general sales manager, Chase Brass & Copper Co., subsidiary of Kennecott Copper Corp.; **A. R. Arm-**

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strong, named Western regional manager, San Francisco headquarters.

J. R. Craine, promoted to branch manager, East Central district, The Cooper-Bessemer Corp., Mount Vernon, O.



J. A. Coe, elected chairman of the board, The American Brass Co.

R. J. Cantwell, elected comptroller, The Babcock & Wilcox Co., New York.

P. G. Cawrey, appointed aircraft sales manager, Western Div., Aeroquip Corp., Burbank, Calif.

R. H. Bragg, named supervisor, material control, Hercules Motors Corp., Canton, O.

E. A. Raney, appointed manager, Dynamics Div., Wyle Research Corp., El Segundo, Calif.



R. M. Stewart, elected president, The American Brass Co.

L. J. Russ, appointed district manager, Buffalo area, Luria Brothers & Co., Inc.

Al Trail, promoted to district sales manager, Cleveland office, Vickers Inc., Detroit.

M. D. Coate, named manager, customer service and **L. J. Adams**, appointed merchandise manager, Mechanical Goods Div., The Dayton Rubber Co., Dayton, O.

C. G. Thomas, named acting manager, purchases, Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.

H. D. Honan, appointed manager, industrial sales, I-T-E Circuit Breaker Co., Philadelphia; **A. G. Curtin**, named manager, contractor sales.



P. H. Reynolds, appointed works engineer, Pittsburgh Works, Jones & Laughlin Steel Corp.

R. F. Reid, appointed manager, machine tool sales, Union Twist Drill Co.

F. R. Soyka, appointed director, purchases, Eutectic Welding Alloys Corp., Flushing, N. Y.

J. E. Hewson, appointed manager, New York sales region, The Foxboro Co., Foxboro, Mass.; **E. H. Huckman**, named asst. field sales manager.

W. A. Smith, appointed superintendent, Production Planning Dept., Crucible Steel Co.'s Park Works,



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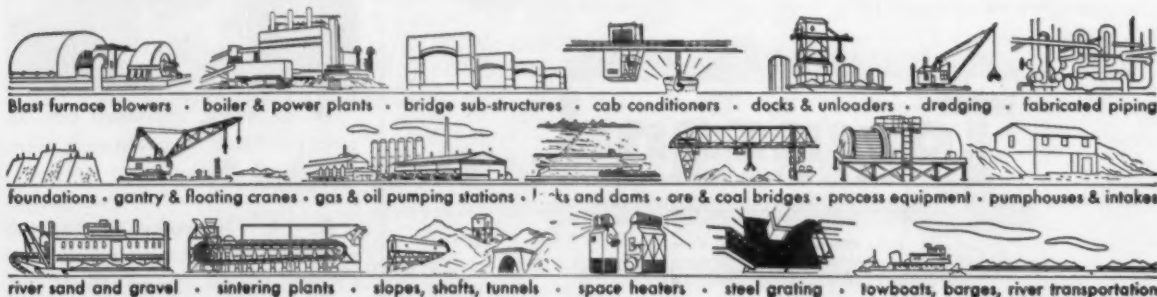
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Pittsburgh; **L. R. Norrick**, appointed industrial engineer, Park Works.

Paul Yavorsky, named technical director, Zirconium Corp. of America, Solon, O.



S. O. Drivdahl, appointed general sales manager, contract manufactured products, General Mfg. Div., Scovill Mfg. Co., Waterbury, Conn.

R. P. Schuler, promoted to manager, North Mills, Inland Steel Co.'s Indiana Harbor Works, E. Chicago.

D. G. Watson, appointed tool steel supervisor, and **W. C. Baum**, stainless steel supervisor, Crucible Steel Co. of America's Indianapolis, Ind., sales branch.



W. G. Walk, appointed asst. to vice president, maintenance planning, U. S. Steel Corp.

R. A. Rothacker, appointed superintendent, Republic Steel Corp.'s Union Drawn Steel Div.

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plant, Gary, Ind.; **A. B. Seitz**, named superintendent, Beaver Falls, Pa., plant.

G. V. Patterson, appointed general manager, Ventilator Div., The Swartwout Co., Cleveland.



F. O. Phillips, named general superintendent, Johnstown Works, U. S. Steel Corp.

J. G. Frischkorn, Jr., appointed sales manager, Cleveland Tramrail Div., The Cleveland Crane & Engineering Co., Wickliffe, O.

A. N. Johnston, Jr., appointed manager, central sales region, Raybestos-Manhattan, Inc., Passaic, N. J.; **H. P. McLaughlin**, named Pittsburgh district manager.

A. D. Nusser, appointed asst. manager, Pittsburgh sales branch, Crucible Steel Co. of America.



N. J. Johnson, appointed manager, operations, A. M. Byers Co., Pittsburgh.

D. E. Cornmesser, appointed plant manager, Rubatex Div., Great American Industries, Inc., Bedford, Va.

I. P. Schwerd, appointed chief engineer, Belleville, N. J. manufacturing plant, L. Sonneborn Sons, Inc., New York.

J. D. Zinser, appointed sales representative, Western Pennsylvania area, Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit.

J. E. Barnes, appointed sales engineer, indirect field sales, Buhr Machine Tool Co., Ann Arbor, Mich.

E. J. Duncan, appointed metallurgical engineer, Latrobe Steel Co., Latrobe, Pa.



R. F. Watson, appointed Merchant Products development manager, Kaiser Aluminum & Chemical Sales, Inc.

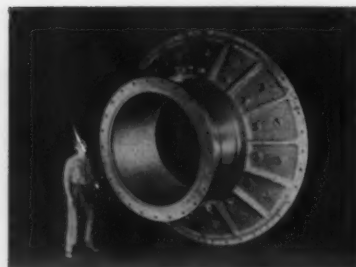
C. M. Hammer, named product specialist, vacuum processing equipment, F. J. Stokes Corp., Philadelphia.

J. P. Thompson, appointed Cleveland area representative, Eastern Stainless Steel Corp., Baltimore.

Leonard Szczepanski, appointed purchasing agent, Chicago plant, Inland Steel Container Co., Div. of Inland Steel Co.

OBITUARIES

J. W. Monson, 35, superintendent, Blast Furnace Dept., Colorado Fuel & Iron Corp.'s Pueblo plant.



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Blackmer Pump Co., Grand Rapids, Mich.
E. W. Bliss Co., Canton and Toledo, Ohio and Hastings, Mich.
Centrifugally Cast Products Div., The Shenango Furnace Co., Dover, Ohio
Compton Foundry, Compton, Calif.
Continental Gin Co., Birmingham, Ala.
The Cooper-Bessemer Corp., Mt. Vernon, Ohio and Grove City, Pa.
Crawford & Doherty Foundry Co., Portland, Ore.
Empire Pattern & Foundry Co., Tulsa, Okla. and Bonham, Texas
Florence Pipe Foundry & Machine Co., Florence, N. J.
Fulton Foundry & Machines Co., Inc., Cleveland, Ohio
General Foundry & Mfg. Co., Flint, Mich.
Georgia Iron Works, Augusta, Ga.
Greenlee Foundries, Inc., Chicago, Ill.
The Hamilton Foundry & Machine Co., Hamilton, Ohio
Hardinge Company, Inc., New York, N. Y.
Hardinge Manufacturing Co., York, Pa.
Johnstone Foundries, Inc., Grove City, Pa.
Kanawha Manufacturing Co., Charleston, W. Va.
Kennedy Van Saun Mfg. & Eng. Corp., Danville, Pa.
Lincoln Foundry Corp., Los Angeles, Calif.
Nordberg Manufacturing Co., Milwaukee, Wis. and St. Louis, Mo.
Palmyra Foundry Co., Inc., Palmyra, N. J.
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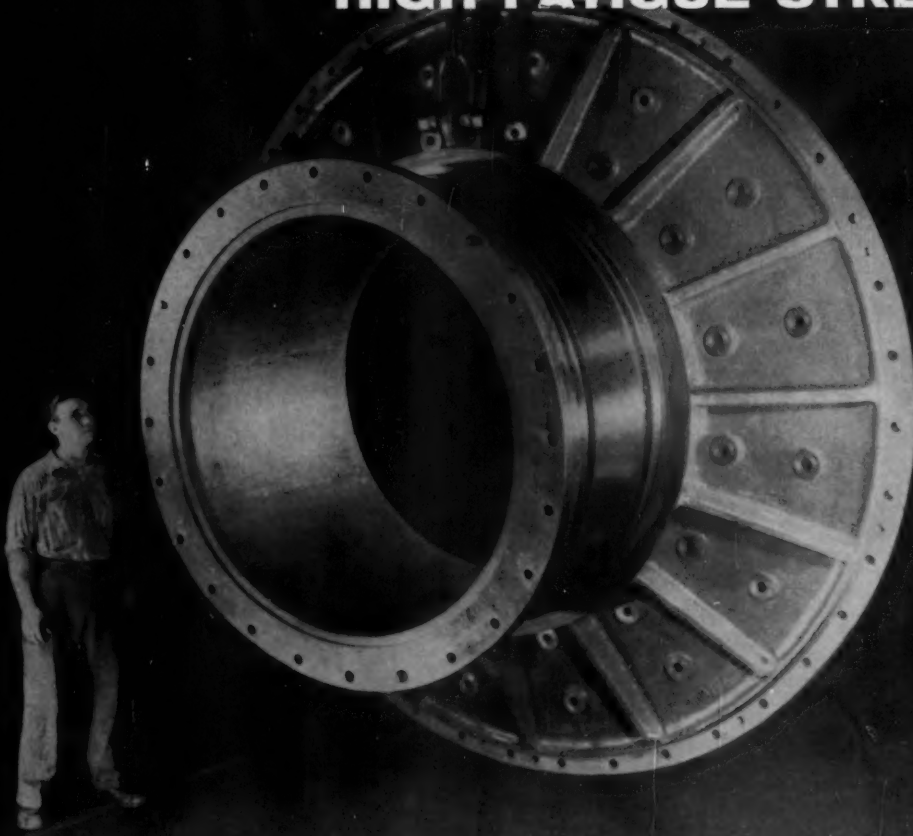
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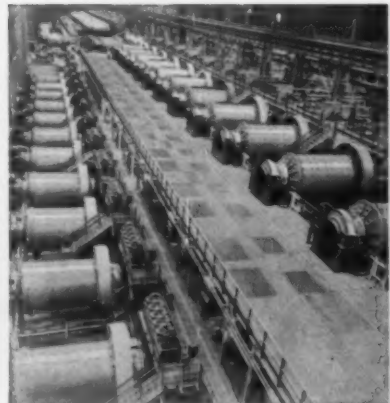
In service, each trunnion supports a continuously rotating and shifting load in excess of 200 tons. Though subject to heavy moving stresses day in and day out, Meehanite metal possesses the mechanical properties necessary for long continuous operation

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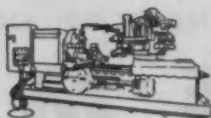


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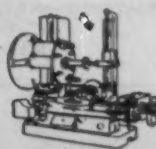
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Si	2.42	2.38	
Mn	0.91	0.54	
S	0.09	0.10	
P	0.27	0.25	
CE	4.36	4.33	
Cutting Speed (ft./min.)	315	315	
Feed (in./rev.)	.009	.009	
Depth of Cut (in.)	.062	.062	
Wear Land (in.)	.010	.010	
Vol. of metal removed (cu. in.)	19.4	33.7	
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64-64 R

It's Time to Reappraise Foundry Automation

By Leon F. Miller—Vice President, Machine Div., The Osborn Mfg. Co., Cleveland

In many ways, automation seems made to order for the foundry industry.

It's already produced some benefits, promises many more.

But the drive for more speed without regard for other factors could delay progress. Now is the time to pause and re-evaluate the entire concept.

■ In recent years, U. S. foundries have spent millions of dollars on new equipment and production techniques. Vast improvements have been made on almost every type and kind of equipment and material they use. Moreover, new production methods have come into being such as shell molding and CO₂ curing of cores and molds, along with new techniques in investment molding.

Each new method has its advantages. But the time-tested green sand molding method is still the most widely used and the one which produces the greatest tonnage of castings. It seems likely to remain so for some time, judging by the present rate of improvement in the new processes.

But now that industry has entered a new era of mechanization, this question is logically raised: "What has automation done for this universal method of making castings, and what can it do in the future?"

Progress, But—Speaking specifically of mold making equipment for production type foundries, much



AUTOMATION FOR TOMORROW: The author (second from right) discusses a model of some new foundry equipment with Osborn engineers.

has been accomplished. But even this progress is relatively little in view of what can and should be done.

The one thing all foundrymen ask for in molding equipment is more speed. They reason that because higher speeds mean more output per manhour, faster machines will save money at the

greatest rate and will be the easiest to justify.

The basic fault with this reasoning is that it over-simplifies the molding problem. It focuses the spotlight almost entirely on speed of operation. Long-range thinking calls for re-evaluating the importance of the speed factor in foundry production machinery. Cold, hard

Foundry Show Facts

Place:

Cleveland Public Auditorium

Dates:

Monday, May 19 through Friday, May 23

Show Hours:

Monday, 8:30-5:30; Tuesday, Thursday and Friday, 9:30-5:30; Wednesday, 11:00-5:30

Conference Hours:

9:00-5:30 daily

experience shows that a sensible production speed is one that's balanced properly against other important operating requirements.

Speed to Burn — Actually, the speed problem in foundry equipment is comparable to the one presented by the 100-mph automobile. Door to door, the high powered car won't get you home from the office reasonably sooner than one that goes only 50 mph, but it will cost you more to get there.

Let's face it: just as traffic problems prevent full use of the expensive, 100-mph car, so does the foundry traffic problem of handling flasks and molds stand in the way of the so-called high-speed molding machine. There's even a dilemma here, because you may solve the traffic problem and still find that your molding machine isn't rugged enough to run at uninterrupted high speeds.

Right now, speeds on automatic molding equipment seem to be reaching a practical limit. Until more attention is paid to such machine factors as (1) cost of operation, (2) dependability, (3) quality

of output, and (4) worker morale and efficiency, more speed by itself doesn't seem to be very practical or profitable. But in the areas outlined, equipment makers can contribute much toward the end of better castings at lower cost.

Key Operating Costs—For example, the cost of operating foundry machinery takes into account such items as direct and indirect labor, maintenance, scrap, salvage, space requirements, raw material storage, product storage, traffic, and supervision.

Maintenance, including repair parts and labor, is one of the biggest single items. Unfortunately, as machines were automated, they grew more complex. What's needed is simpler design — fewer working parts—to reduce machine failures, downtime, and maintenance costs. There's no point in spending a dollar for maintenance to save a dollar in production costs.

Granted that sand is the foundry's chief raw material and that it's rough on machinery. The sand must be dealt with, but concentrating on molding methods that

keep it in the mold will do much to cut maintenance costs. Progress is being made with blowing methods, as in the shell molding technique where sand is loaded into the mold in a totally confined enclosure. Molding methods using flexible diaphragms also show promise for keeping sand where it belongs.

Where Dependability Counts — As for the dependability of molding equipment, it's obvious that this is a major factor in maintaining production schedules. It's not enough that the machinery should be able to function, it must also turn out quality products consistently without anything more than normal attention. Thus it follows that dependability is directly related to the maintenance problem.

But the equipment manufacturer has a difficult task when it comes to making machines that are both trouble free and easier and more economical to maintain. In the past, compressed air has been used almost universally to actuate and control foundry equipment. Now, careful studies are being made of both electronic and hydraulic devices with a view toward greater machine dependability.

The human element in equipment dependability cannot be overlooked, however. As automated machines become more numerous, the job of keeping them in trim should be handled by men with proper training and attitudes. To get the most for their equipment dollar, foundrymen must realize that no machine is going to think for itself. Regular inspection and preventive maintenance must become as basic as actual production techniques.

Quality Not Automatic — Now, what about the quality of the molds and castings that stem from the use of automated machinery? High speed equipment can be set to make quality products, but quality is not an assured byproduct under all conditions. Speed can affect quality, and vice versa. Striving for the best balance of these factors is wise, but too often the emphasis is on the

Knows Foundryman's Problems

Right at home in a foundry — any foundry — is Leon F. Miller, sales and engineering vice president of the Machine Div., and a director of The Osborn Mfg. Co., Cleveland.

It's only natural that he should feel at ease in such surroundings. He's devoted 29 years to the job of helping foundrymen improve their production operations.

Mr. Miller joined Osborn as a draftsman in 1929, after attending Case Institute of Technology. Promoted to sales engineer in 1935, he became sales manager in 1944, was elected vice president in 1950.

A longtime member of the American Foundrymen's Society, he has also served on the board of directors of that organization.



POINT BY POINT: Ticking off the features of new foundry machinery is no problem for Mr. Miller, experienced engineer and salesman.

side of speed. Attention to quality must start at the heart of the operation. It involves the machinery, operator's attitude, raw materials, and particularly, supervision.

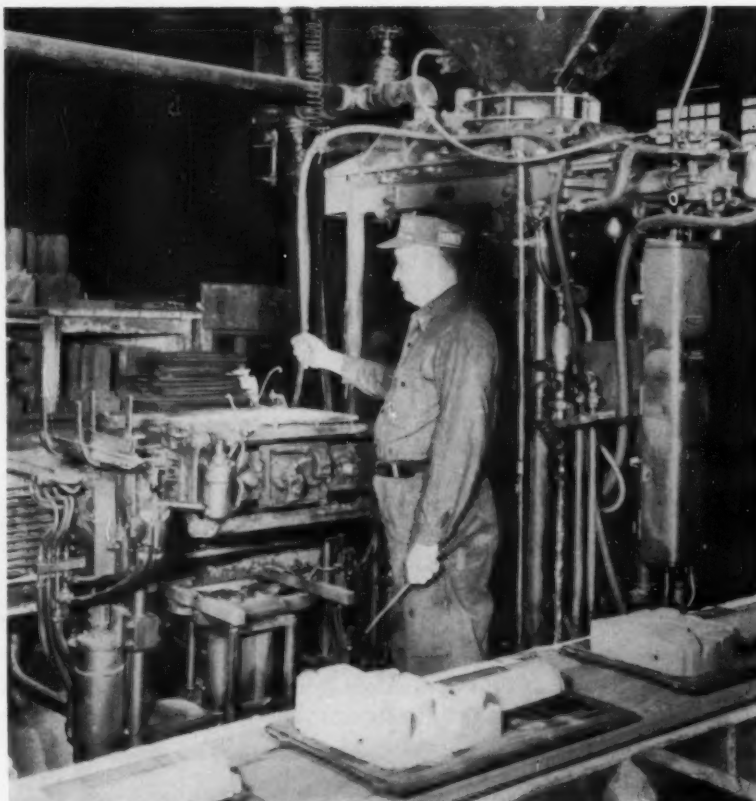
Quality as related to accuracy and density of molds is generally taken for granted. And a certain uniformity of quality—be it good or bad—is more assured with automatic control of machines and materials. This is borne out in automotive foundries where push-buttons control virtually every step from sand preparation to finished castings. Thus, it seems that quality can be held at desired levels even at high production speeds.

One of the basic advantages on which automated operation has been sold is the inherent ability of equipment to turn out quality work on an unvarying time cycle. This is important to the production foundry where fixed schedules must be met regardless of the time of day or absenteeism. For this reason, the demand will be for more automation than less, if the concept is applied intelligently.

How About People? — Finally, let's consider the influence of automated foundry equipment on working conditions. These are the factors that reflect an employee's attitude toward the company, its products, and his own job.

Equipment makers and foundry managers have a joint responsibility in the matter of safe, adequate, and practical working conditions. Due to the nature of foundry work and the materials used, strict cleanliness is just impractical. But there is no excuse for conditions that are too sandy, too dusty, or too smoky. Just plain good housekeeping can do a lot of good.

Newer types of foundry equipment have improved operator morale in two important ways, however. For one thing, they've reduced physical fatigue which cuts a man's output and efficiency. In so doing, they've boosted morale in still another way: changing the foundryman's job from physical labor to one that makes him an



FASTER PRODUCTION: Osborn core blower and core-box rolover machine are speeding core output at Allyne-Ryan Foundry, Cleveland.

equipment supervisor. Because men are hard to get in busy periods, these benefits will strengthen the demand for automatic machinery.

Then, too, by concentrating molding operations in fewer machines, it's easier for a foundry to set up better control of dust collecting, ventilation and lighting.

Noise a Big Item — However, foundries at best are still full of noise makers. In time, the sources of noise will either have to be eliminated or means provided to reduce the noise level.

The sounds of molding machines during the jolting cycle, and the exhaust noise from pneumatic cylinders, are big contributors to these high noise levels. Add the noise involved in mold shakeout and the level goes still higher.

Since the effects of various noise levels on human efficiency are known factors, the cost of reducing these sounds can be measured in terms of increased operator effi-

ciency in the molding room. The positive steps that can be taken will have a more beneficial effect than most foundrymen realize.

Thus far, foundry production machinery has contributed to better working conditions mainly as a by-product of mechanizing manual operations. Henceforth, the equipment maker must not think of working conditions as a byproduct, but as an integral necessity for quality production.

Much-improved machinery will be available in the not too distant future. And although the emphasis will be on high production equipment, the smaller jobbing foundry will eventually benefit from many of these new automation concepts.

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DAILY SESSION: Pattern review section meets every day to clear all patterns that came in during the past 24

hours. Members are representatives from sales, foundry engineering and production groups.

Close Control Keeps Foundry on Schedule

By G. E. Loftin—Production Manager, Lebanon Steel Foundry, Lebanon, Pa.

Good work alone doesn't make a jobbing foundry prosper today. Customers are demanding faster service and on-time deliveries as well.

This calls for precise scheduling and control of all phases, along with gridiron-style teamwork between departments.

■ Process control in a jobbing steel foundry is a complicated affair. No one can tell in advance precisely what will happen when molten steel at 2900°F runs into a sand mold. Actually, it may never be an exact science.

This makes it all the more neces-

sary for a foundry to use rigid control methods in areas where standard rates and data do apply. If it's known in advance that one operation may give trouble, a control system can be developed around it to give the most possible leeway when things go wrong.

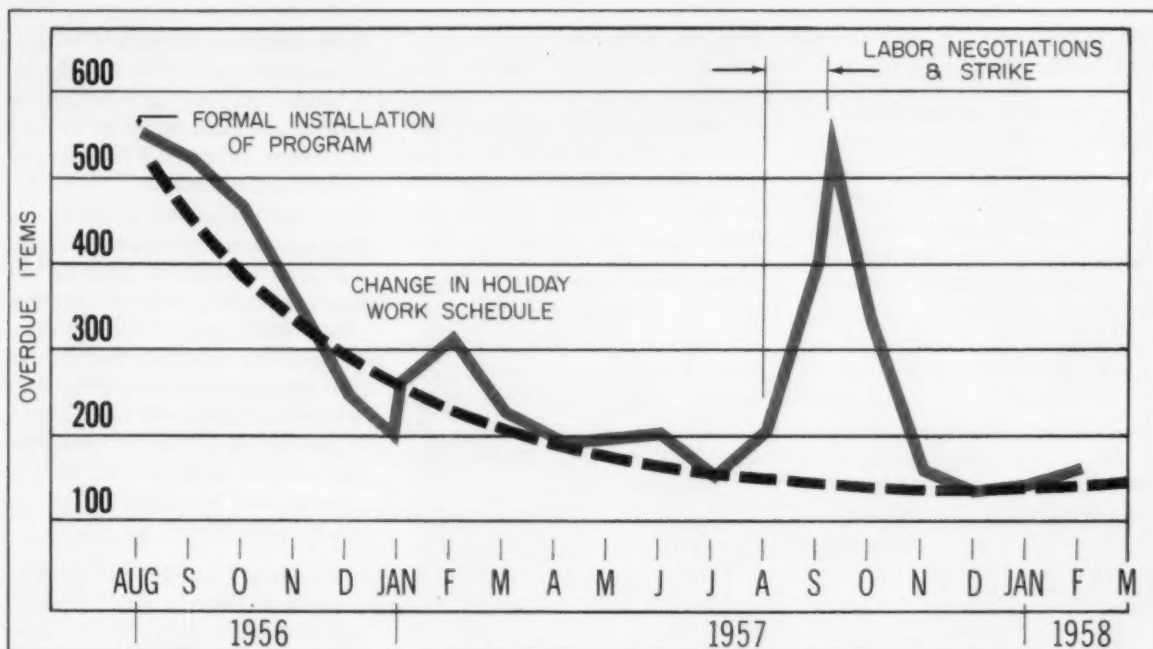
During the Korean War years, foundries like Lebanon operated in a situation where demand exceeded capacity. Defense contracts, especially in armor and aircraft castings, meant large runs and tonnages from just a few customers and pattern designs. Commercial customers came second and often waited 8 to 12 weeks for delivery.

Different Today — The change

from a seller's to a buyer's market has forced the foundry into a new scheme of production. Today, casting tonnage is acquired only by serving a broad customer base with an almost limitless number of different needs.

With literally thousands of different patterns, a minimum of 85 alloys, and customers demanding fast delivery, the foundry has to have a system of checks and controls that's nearly foolproof.

Pattern scheduling and control are important in a jobbing steel foundry. At Lebanon it begins with the pattern review section. This is an engineering group which meets daily and must clear for production



PROOF IT WORKS: Except for unavoidable delays, overdue items have steadily declined.

all patterns which have arrived at the foundry during the past 24 hours. The group includes representatives from sales, foundry engineering, and production.

Covers Three Areas—The review section's work is divided into three broad functions: First, it reviews each pattern in terms of a works order card processed by the sales department, and determines fitness of the pattern for foundry production; then, if the pattern needs work, it's specified on the same card and the pattern is scheduled into the pattern shop; and if foundry engineering work is required, this fact is also noted.

The pattern review section's work is completed by noon of each day.

New patterns are produced either at Lebanon or at an outside jobbing pattern shop. All patterns, whether newly made or from the customer, are checked against drawings for dimensional accuracy.

After checking, if a sample or prototype casting is deemed necessary by foundry engineering, it's poured on a high priority. If, after cleaning and inspection, the casting is found satisfactory, the pattern is released for full production.

Dates Are Law—Promptly at one o'clock all patterns which have cleared the pattern review section are processed for pattern shop or foundry scheduling. At this point the assistant production manager assigns target molding and shipping dates for each pattern. He compares these dates with customer needs; if there is any difference, it must be reconciled with the customer immediately.

Once a molding date is set, it becomes law right up to actual pouring of the casting. Detailed control starts right after assignment of molding and shipping dates.

Scheduling by standard data in a jobbing steel foundry is akin to that in other fields; it results from applying data to all operations so that orders proceed in a predictable time sequence. Lebanon pioneered in development of standard molding data, making it possible to predict, within minutes, the time needed for each step in all molding areas.

Rate Each Job—As soon as a pattern is cleared from pattern preparation and engineering, it goes to job raters who establish a standard molding time. The job raters decide

how much time will be needed—and allowed—to make a mold on the machine assigned. The total of these computations can be easily translated into the foundry backlog, in days, for the molding departments.

After job rating, the pattern is released to the foundry scheduler, who must coordinate it with his overall production plan. In doing so, he has to consider the delivery commitment, as well as maintain a balanced machine work load, steady mold load and consistent tonnage.

One-Week Plan—The first step of the foundry scheduler is to prepare a five-day advance schedule, which forms the operating plan for each week.

This schedule is sent to all departments. It assures that all advance planning on the molding floors is done; all cores and chills are ready to meet machine demand; melting is planned so the right metal is ready at the right time to keep molds moving away from the machines and to the shakeout; and alerts the metallurgical department

and laboratories for any special work in the planned heats.

Day-to-Day Schedule—Once the five-day advance schedule has been set up, a 24-hour advance schedule is prepared. This schedule forms the basis for moving patterns from the staging area to the molding machines. It also assures that cores and chills prepared in accordance with the five-day schedule are delivered to the molding area in proper sequence.

The 24-hour schedule covers sand as well. A sand plan is prepared in accordance with the different sand types to be used. The 24-hour advance schedule coordinates mold drying, core delivery and mold cooling so that molds and cores are delivered to the closing floor at the same time.

And finally, the 24-hour schedule fixes a precise melting schedule and timing of each heat.

After the 24-hour schedule has

been run in the foundry, the scheduler checks for items missed. Any such items are given first priority on the succeeding day's schedule. This prevents an accumulation of late items; the scheduler is responsible for seeing that they get back into their normal production flow.

For Emergency Work—To provide for emergencies like sample castings or other rush work, the foundry maintains a 2 pct flexibility in each 24-hour schedule. This lets the scheduler keep all top priority items moving; he knows in advance that so many man hours and machine hours are available exclusively for this purpose.

Emergency items are specially designated by different colored job tickets which remain with the job right up through final shakeout. This alerts all crews to process these castings first, regardless of existing backlog or work load.

So that foundry scheduling may

be constantly improved and to minimize all factors which cause delays, a production meeting is held twice weekly. It's attended by all foundry schedulers, department foremen and supervisory personnel.

At this meeting the previous two days operation is reviewed in detail. All items missed on schedule are discussed, and corrective measures taken. The schedulers alert foundry personnel to difficult or complicated jobs being planned during the next scheduling period. All special work is anticipated so that both the five-day advance schedule and 24-hour schedule will be completely practical when established.

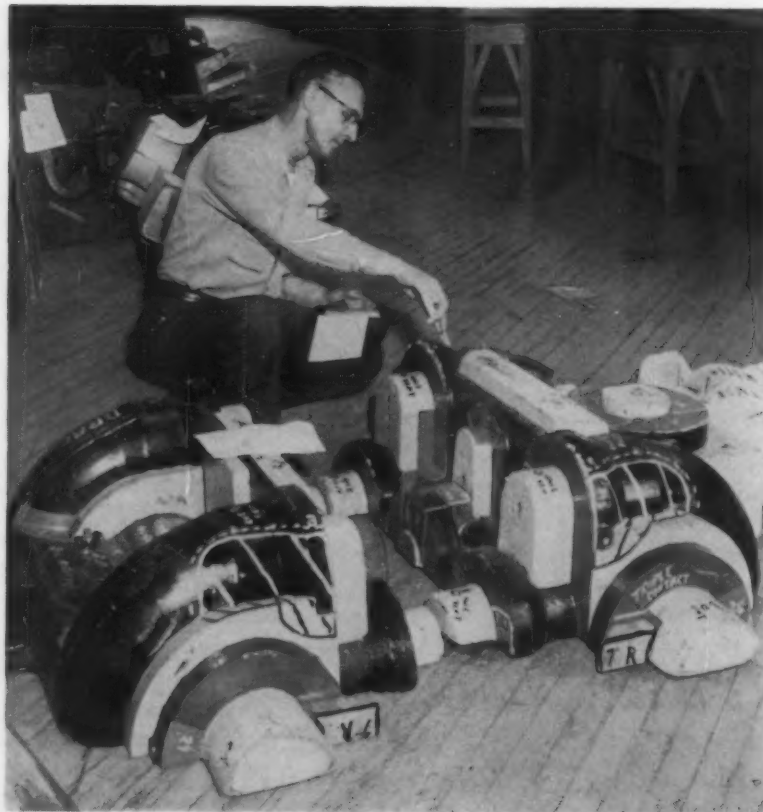
Cleaning Control—The cleaning room is perhaps the greatest potential bottleneck in a jobbing steel foundry. Castings arriving from shakeout need a great diversity of work.

When the foundry is operating at peak capacity there's a natural tendency to skip over a casting that's hard to clean. This can cause delays which are cumulative; castings might be misplaced or lost. By the time it's discovered, there's little chance of returning the item to schedule without disrupting sequence still further.

Controls at Lebanon establish rigid priority for processing all castings, furnish information on shipping commitments to all line supervisors, and provide a running report of the status of each casting in relation to delivery.

All castings are assigned to specific areas for processing according to weight range. The divisions are: up to 100 lb; 100 to 600 lb; over 600 lb; and X-ray. The system fixes responsibility to each area for the group of castings involved.

Keeping Tabs—When a pouring report is received by the dispatcher in the cleaning room, he prepares two control tabs; one for the master panel and one for the area control panel. These tabs identify the casting by customer, pattern number, description, weight, date poured, pieces due, and delivery date.



DECIDES TIME: Job rater establishes the standard molding and coring times that will be allowed in setting up schedules for a pattern.

Based on the delivery commitment, the order of processing is established; then the tabs are arranged on the control panel according to priority and by week in which the order is due for delivery.

Daily routine operations on the control panel are simple and take only about an hour each day. Shipments are deducted from the board and completed items removed. Any overdue items are placed in the delinquent category at the top of the board to insure first attention. Tabs are also moved if for some reason delivery dates are revised.

Panels Show Status—The control panel in each area provides the foreman with a quick picture of his entire operation. It tells him exactly what castings are being processed in his area, their order of importance, and enables him to plan his work to meet shipping dates. He is also informed, on a day-to-day basis, of any projected work build-up in his area, or any special or difficult work which may require extra personnel or equipment.

From the central control panel, a Status of Operations report is prepared weekly. It shows the total number of items processed in each area and the number of delinquent items left. The foundry superintendent can then correct things right away.

Special Group—Some factors in a steel foundry don't lend themselves to controls. To compensate for them and keep customers fully informed, a customer service group at Lebanon now operates within the production, planning and control function. As a result of this group's work a customer can get the exact status of his order in a matter of minutes. In cases of sudden cancellation or design change, this has saved both the foundry and customer much needless expense.

Each man in the group is assigned about 400 items, and he must check on each item at least once a week. He is directly responsible for all inquiries concerning delivery and submits any reports the customer may require.



COMPLETE RECORD: General pattern control panel shows the exact location of each pattern in process. Notations indicate any repair work or alterations, as well as due dates for foundry scheduling.

If an order isn't moving as it should, he at once advises the departments concerned so extra work will be devoted to bring the item back on schedule. If it proves impossible to get the item back on schedule, the customer is advised and a new delivery date confirmed.

For emergency items such as sample castings, and for any other work which must be done on a crash basis, Lebanon has a small group of hourly-paid expeditors. These men help the foreman follow through on the short-delivery items which a jobbing steel foundry must handle as a customer convenience.

Extra Incentive—Another good working tool is an element of the incentive plan for supervisors which is based on schedule compliance. By proper attention to delivery, a supervisor can increase his earnings by a maximum of 6 pct of his base pay.

The schedule compliance factor

is computed as follows: First, the number of delinquent items is multiplied by weeks overdue and this is subtracted from the total number of items in process; the result is then divided by total items in process and multiplied by 100 to get pct effectiveness.

These methods of production scheduling and control have been in effect at Lebanon for 18 months. During that time, 93 pct of all orders were shipped on schedule—and the figure is improving. The goal of 100 pct may never be reached by a jobbing steel foundry that has to plan and process so many different jobs, yet it must always serve as a challenge.

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SERVICE IN DEMAND: Head of firm, J. Thompson (left) and his two engineers cope with reject problems.

Inspection Team Serves Supplier and User

Where there's a need, there's opportunity to provide service.

Such is the case with defective parts.

A new outfit set up to correct deficiencies finds itself in demand for fast versatile service.

By R. H. Eshelman—Engineering Editor

■ Rejected shipments are a big headache to both suppliers and manufacturers. Suppliers face costly repairs, unhappy customers and even loss of orders. To manufacturers, rejects spell trouble for inspection and purchasing depart-

ments. Worse, they may even delay production.

Just because the defects are minor is no consolation. The effects are just as painful.

A Detroit physicist, John Thompson, with a background of commercial experience, including sales engineering, translated these troubles into an opportunity. In the early post-war years, he'd heard of supply bottlenecks where automotive firms air-freighted head bolts to keep production moving. In one instance, even frames were brought in by air transport to start a new model year.

Salvage Costs High—One day a friend related how he and two

other company engineers spent three days trouble-shooting an initial shipment of defective parts. With overtime, travel, hotel and food expenses, total cost to the company was about \$800, far more than the shipment was worth.

This was enough to send Thompson into action. An investigation confirmed his suspicion: Purchasing, inspection and receiving departments are plagued with rejected shipments. Often it's the cheapest parts that are the worst headache, because their value is much less than the cost of salvage or repair.

Items such as gaskets, springs, washers, rivets, nuts and bolts fall in this category. Yet they're often

just as essential to production as a body or engine block.

Burden on Supplier—Until parts are accepted by receiving inspection, most prime manufacturers assume no responsibility for them. In most large plants inspection is by sampling methods based on statistical quality control. It's for this reason that 90 pct of a rejected shipment can often be salvaged merely by 100-pct inspection.

If the supplier elects to have the shipment returned to his own plant, he may lose the business. Double shipping expenses and emergency repair or salvage can also boost costs well past the point of profitable operation. Corrective action in the users plant is usually the more costly alternative.

Sets Up Service—To fill this gap Thompson has established a full-time inspection and engineering repair service. It's known as the Cruis-Aire Co. He laid the groundwork by visiting purchasing, receiving, inspection and quality control departments of major plants in the Detroit area.

Then he obtained permission to operate as service representative of their suppliers. He found most of his contacts glad to go along with the idea, at least on a trial basis, since it offered a possible cure of a nagging problem.

In addition to a small full-time crew including two graduate engineers with wide production experience, the firm has a reserve labor force of some 20 people. Among the service force are retired inspectors and housewives. The initial survey of each prospective job picks out the needed skills.

Analysis Pays—The firm tackles correction of defective parts through engineering analysis. For instance, take the case of a shipment of 60,000 gaskets worth about 1/2¢ each.

As parts for an automatic transmission, they had to be perfectly clean. But cork crumbs adhered to many of them during stamping.

The engineers designed a fixture

to clean 120 gaskets at a time. This simple sheet-metal and steel-rod fixture was inexpensive to make. Yet it reduced the salvage operation to a mere brushing and vacuum cleaning of the gaskets both inside and out.

Simplify Repairs — Handling costs must be minimized. Unless a method can be devised to process large numbers of parts, repair costs quickly exceed value of the lot.

The largest component Cruis-Aire has serviced is an automotive frame. Due to loading, unloading or rough handling on gondola cars, some cross members or mounting flanges were damaged.

Frames go into a qualifying jig at receiving inspection and the rejects are quickly marked for repair. Corrective action consists of removing badly damaged parts and welding on new ones. Often it's only necessary to bend clips or flanges back in position, or relocate a hole.

Varied Jobs — Another automotive job consists of checking air-ride relief valves. On such parts, 100-pct inspection can salvage most of the units.

Other types of parts include door locks, clutch disks, coil springs, accelerator control rods, and tubular parts for pressure oil systems. While some of these need a mere inspection, others involve sorting and corrective action.

On a spring shipment, for example, small steel burrs were objectionable. The inspection crew segregated the poor parts. The repairs were then made by removing the burrs with a small grinder.

Some Limitations — In some cases, the initial survey shows that salvage operations are either impossible or not economical. A shipment of 8000 rivets, which had rusted badly, was of this type.

Plated parts that are streaked or discolored are prohibitive to correct. Inexpensive stamping with a hole mislocated would be another costly repair.

The larger the part or the greater

the number of pieces involved, the better the chance they have of rendering a true service, according to Thompson.

Conditions Changing — With major manufacturers limiting inventories to create more productive space, timing of shipments has become critical. Rising labor costs and overhead have all but eliminated the in-plant labor pool. When a defective shipment arrives, the assembler's production schedule may not allow for correcting the shipment.

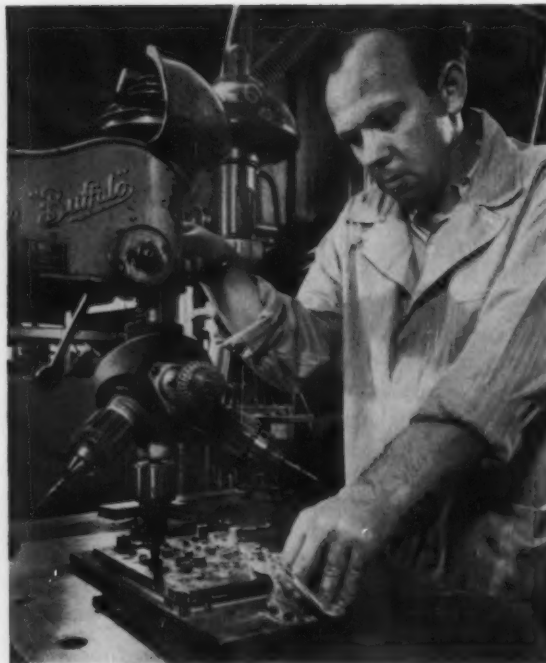
That's why manufacturers are placing more and more responsibility on the supplier for a dependable source of quality parts. But suppliers must cut production costs through automation and other means. Substandard parts can get mixed into a shipment before anyone is aware of it. Here's where the inspection service can step in and serve both manufacturer and supplier.



SIMPLE TOOLS: Fixture holds 120 gaskets. Fast brushing and vacuuming of these parts makes salvaging profitable.



SPEEDS SAWING: Pollard circular saw makes fast, accurate cuts on laminates up to 4 in. thick, uses diamond-tipped or carbide blades.



CAREFUL DRILLING: Light, uniform pressure on the feed lever gives best results, along with a fixture that clamps work top and bottom.

How to Machine Laminated Plastics

By T. R. Silk—Plant Manager, Continental-Diamond Fibre Corp., Newark, Del.

For the most part, laminated plastics are easy to machine.

You use standard equipment—the same kind you're accustomed to working with on metal and wood.

But when it comes to methods, a little bit of special knowhow makes a big difference in quality and output.

■ Plastic laminates can be cut in a variety of ways. One of the popular methods is shearing. Some paper-base grades up to 1/16 in.

thick and most fabric-base grades up to 1/8 in. are cut at room temperature (minimum of 60°F) on a standard guillotine-type metal squaring shear. Rotary shearing of fabric-base grades may be done at room temperature on laminates up to 1/8 in.

Harder grades up to 1/8 in. thick, such as asbestos and glass, can be sheared after heating the laminate to between 200 and 250°F, depending on grade and thickness. Heat is applied by placing the laminates in hot ovens, or under a bank of infrared lamps, taking care to prevent excessive heating. Wherever possi-

ble, however, avoid hot shearing to preserve dimensional stability.

Shearing may be performed at speeds up to 50 strokes per minute with hand feeding, or 600 fpm for rotary shearing.

Glass-base laminates in thicknesses over 1/8 in. must be sawed. The same holds true for all other materials in thicknesses over 1/4 in. Vulcanized fibre sheet may be sheared like metal—thicknesses up to 1/16 in. with a hand-operated drop-knife shear and sheets up to 1/4 in. on a power-operated metal square shear or rotary slitter. For



LATHE WORK: Most standard lathe operations can be performed on laminated plastics. Steady, continuous feed provides better finish.



SIMPLE JOB: Most plastics mill like brass, so the same general procedure can be used. Carbide-tipped tools permit higher speeds.

better edges in heavy thicknesses, heating to 200°F will help.

Sawing and Cut-off—For paper and fabric base materials, a standard woodworking band saw does the trick where close tolerances or smooth edges are not important. Teeth range from 5 to 8 points per in., cutting speeds up to 9000 fpm.

Band sawing is recommended for curved or straight cuts on material up to 10 in. thick, but not for straight cuts on material that is thin enough to be cut with a circular saw. Smooth edges and close tolerances call for a hollow-ground circular saw without set. Speeds range up to 10,000 fpm.

Small sheets of glass-base laminates can be cut from stock sheets over 1/8 in. only by circular sawing. Metal-cutting blades result in poor tool life, so Carbide-tipped blades are preferred. Hollow-ground blades with 10 or 12 teeth per in. should be used at speeds not over 2000 sfpm. The best blades for glass-base laminates are diamond cut-off

types like the Felker Di-Met blade. Bonded abrasive cut-off wheels used for stonecutting are also satisfactory.

Use Coolants—With either diamond or bonded abrasive blades, air jets or liquid coolants should be used. A band saw equipped with a skip-tooth or buttress-tooth metal-cutting blade is needed for irregular contours.

Sawing of glass-base laminates requires an efficient pneumatic dust-collector system to prevent excessive deposits of glass dust, which can cause dermatitis and other health hazards.

Laminates up to 1 in. thick can be sawed dry with standard woodworking floor or bench circular sawing machines. Thicknesses up to 4 in. can be sawed wet, using machines especially equipped for water operation. Cutting speeds range up to 13,000 fpm.

Circular saw blades should be 1/16 to 1/18 in. thick, with 4 to 8 teeth per in., depending on grade and thickness of material.

In cutting heavy-walled tubing over 3/4 in. diam, don't feed the material straight through the saw; instead, roll it through to prevent chipping.

Turning Tips—In turning laminated plastics, the work should be fed continuously and steadily; if the cutting tool is stopped in the middle of a pass, the material will be noticeably marked. Skived forming tools are used; but since they produce long, ribbonlike chips on the softer grades, spindle speed

The first part of this three-part feature, in last week's issue, dealt with the materials, their advantages and limitations, and basic factors that bear on machining. The concluding section, appearing next week, will cover screw machine and turret lathe work, planing and shaping, punching, shaving, broaching, postforming, finishing, and marking.

Plastics permit high speeds in almost every operation, but you have to watch out for a new element—resilience.

should be as high as possible to throw chips away from the work.

Honed single-point tools are always advisable. Air cooling by a jet aimed at the tool point is preferable to a liquid coolant.

Thermosetting plastics permit higher surface speeds than thermoplastics, because of their higher heat resistance. Most laminates can be turned at about 400 sfpm with high-speed steel tools. Rake angle should be up to 10° negative, clearance about 35°, and side clearance 15°. Phenolics can be rough cut at a 1/16 to 1/8 in. depth, but should be finished at 0.010 in. Carbide tooling doubles the best surface speed; for ureas and melamines the speed can be from 600 to 1000 fpm, and for phenolics about 1000 fpm.

Glass-base Laminates—Turning operations can be done in ordinary engine lathes at surface speeds of 150 to 200 fpm, and a feed of about 0.010 ipr. Carbide-tipped tools having 33° clearance angle, no back rake or lip, and a side rake of 13°, do the job.

Most ordinary lathe operations can be performed on glass-base laminates, but both internal and external threading are generally poor, resulting in chipped threads. Designers should avoid any type of external thread on glass-base laminates; internal threads—best done by tapping—should be confined to pitches small in proportion to the thickness of the part. Knurling doesn't work well, either.

Designers should specify the finer-weave grades of glass-base laminates if there's going to be any extensive or difficult machining, as these stand up better than the coarser weaves.

Drilling—Laminated plastics can't be drilled with a heavy hand on the feed lever—light, uniform pressure is always best, and a me-

chanical tool feed is preferable to hand feed. Where the plastic is brittle, approach the hole slowly, then increase the speed gradually after the drill has started cutting.

Reducing speed near the breakthrough point helps minimize chipping on the lower surface; whenever possible, the material should be backed up with wood or other soft material to prevent chipping out.

Drills especially designed for use on laminated plastics are now available, such as 923-924-925 series drills made by Cleveland Steel Tool Co. or Morse Twist Drill & Machine Co. They're made of high-speed steel with highly polished, wide flutes to give a slow spiral and greater chip clearance. They have a 90° point, high helix angles, and a long taper; a high polish on the flutes prevents accumulation and sticking of laminate dust and allows the chip to slide out faster. Longer chips prevent balling up of material in the hole.

The Hayden Drill Co. makes a fluteless drill with carbide tip, designed to keep heat of friction from building up, for use on most grades of plastic laminates.

Hole Shrinks—Plastic laminates are resilient and will shrink somewhat after the drill is removed, so holes should be drilled 0.002 to 0.004 in. oversize unless they are to be reamed later.

A tight, well-designed drill jig will clamp the work top and bottom and allow three or more thicknesses of laminate to be drilled continuously without separation of individual pieces. Back-up plates should be used to prevent break-out and to insure a clean, sharp hole.

A knee block or similar clamp should be used if it's necessary to drill parallel to the laminates—a practice that should be avoided wherever possible.

Air Jet is Better—Frictional heat of drilling is best removed by a high-pressure jet of air rather than by lubricants or liquid coolants; the latter are messy to work with and may build up a dust or paste under the drilling jig, tilting it so that drills can't go straight down.

A thin stream of air at high pressure works better than a broad stream of air at low pressure. Drilling speeds are usually slower with air-coolant—about 300 to 350 sfpm, and up to 10,000 rpm, depending on grade and thickness. With care, tolerances as close as 0.001 in. can be obtained.

Drilling of glass-base laminates is best done with Carboloy drills having polished flutes and a slow helix. For through holes in thin sheets, the point should be ground to a 55° included angle; for thick sheets, 90° is satisfactory. Cutting speeds of 150 to 300 fpm with feed of 0.002 in. to 0.003 ipr should be used. Drills should be backed out often to keep the hole clear.

Large holes can be cut with trepanning saws, Carboloy-tipped masonry core drills, or Carboloy-tipped flycutters.

Countersinking, Counterboring—With care, all laminates, including glass-base and felted-asbestos grades, can be countersunk or counterbored. The tool should carry a negative rake of from 0 to 10°, and cutting speeds should be about half those used in drilling. Keep initial contact with the work light in order to cut the highly polished surface without cracking it. If chattering occurs, a slower speed should be used.

Tapping and Threading—Maximum accuracy obtainable in both interior and exterior threading is a 75 pct thread with a Class 2 fit. Resilience in laminates calls for particular attention to rakes on taps and dies or single-point tools. Positive rake causes the tap, die or chaser to dig in and crowd its lead, resulting in a weak thread. Threading tools should have a negative rake angle up to 10°, depending on size of thread, pitch, and degree of finish required.

A ground, high-speed steel tap having 3 flutes is recommended; it should be slightly oversize (0.0015 to 0.002 in.) Dies should have a 33° chamfer on the lead and a negative rake up to 10°. Speeds are up to 200 fpm, with capacities up to 2 in. Hand or engine lathes can be used for all tapping and threading operations.

High-speed nitrided and chromium-plated taps give best results in tapping glass-base laminates; 2- or 3-flute ground, spiral, gun taps are recommended. A negative rake of 5° on the front of the land helps prevent binding and stripping when the tap is removed. Taps 0.002 to 0.008 in. oversize insure full-size thread by compensating for under-size. The entering side of the hole should be chamfered to prevent lifting of laminations by the entering flap. Surface speed is up to 50 fpm.

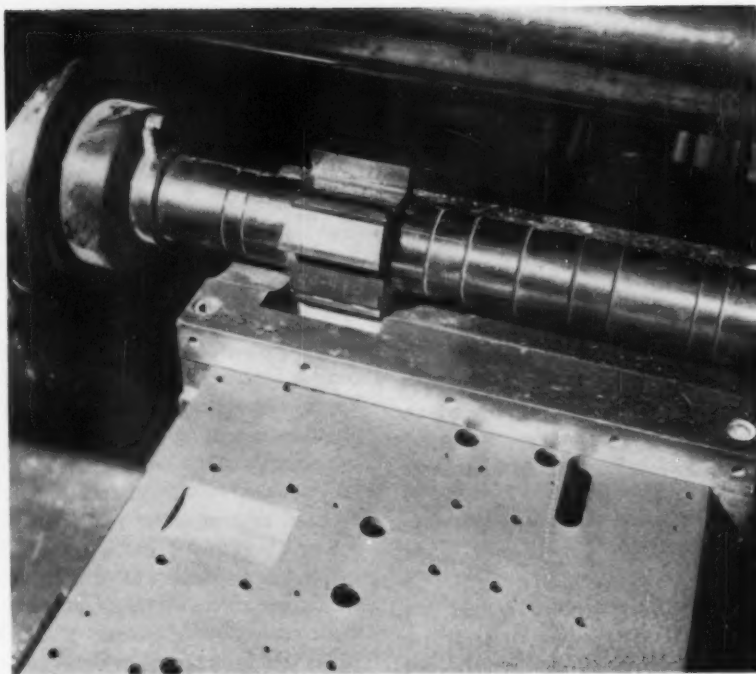
Flycutting—This is a method used to cut disks or large holes in laminated plastics up to 6 in. diam and 1¼ in. thick. The older method employs cutting tools designed so that the center post holding the cutter bar can be used as a pilot in a previously drilled hole to steady the bar during cutting.

A more recent technique is to use air-operated hold-down fixtures which hold the entire piece steady, as well as the circular disk being cut, so there's no need to drill a guide hole for the center post. Flycutting speeds are up to 400 fpm.

Milling—Climb milling, also known as down milling, is the only type recommended for plastic laminates, to prevent the cutter from lifting the layers.

All laminated phenolics can be milled with standard milling cutters. For longer life between sharpenings, however, carbide-tipped cutters are recommended. Speeds up to 1000 sfpm are possible, with feed rates up to 20 ipm with carbide cutters.

Milling on laminated plastics calls for a 10° negative rake on the blades, with good clearance. Most plastics mill like brass, and the same general procedure can be followed.



CLIMB MILLING: Also known as down milling, it keeps the cutter from lifting layers of the laminate. Use 10° negative blade rake.

It's a relatively simple operation calling only for normal care, sharp blades, and normal attention to chip removal and cooling. Because of their generally greater ease of machining as compared with metals, plastic laminates are ideally suited for use with air-actuated fixtures and holding devices.

Milling operations on glass-base laminates can be done very nicely with Carboloy-tipped tools at high surface speeds—about 400 to 800 sfpm. With high-speed steel or carbide-tipped cutters, speeds for glass-base laminates should be kept down to 50 sfpm—about one-quarter to one-third that for most plastic materials.

End Milling—This is a method of cutting large square or rectangular holes in laminates of from ¼ to 1¼ in. thicknesses, using a Carboloy-tipped end mill with 3 or 4 flutes. Holes must first be drilled at all four corners of the square or rectangle; the holes have to be large enough for insertion of the end mill, which turns in a drill chuck on a standard drilling machine. Recommended speeds for

most grades are 500 to 1800 rpm, with feed 10 to 30 ipm.

Gear Cutting—Gears may be cut from the harder grades of plastic laminates, particularly those with synthetic fiber bases, using any of the standard types of gear teeth. Glass-base laminates, because of their brittleness, are not recommended for gears. Sheet stock, rather than tubing or rods, is the form of laminate used, although gears may also be made from macerated-molded material such as Celoron.

Teeth are formed in blanks by hobbing, shaping, or milling on standard metal gear-cutting machines. The highest speed and feed of the machine should be used. Special gearing may be installed to increase surface speed and feed mechanism to rates greater than those common for cutting metal.

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Brazing-Filler Metals

Meet High-Temperature Needs

By A. M. Setapen—Manager of Engineering, Handy & Harman, New York

Here's the run-down on some of the latest developments in brazing alloys—some of which see service at 1600°F.

Even gold alloys are being used to meet souped-up requirements.

■ What brazing filler metals can match the ever increasing temperature demands of rocket and jet engine parts, and high-temperature industrial equipment?

Obviously not the conventional filler metals that served adequately in the past. Time and temperature needs have passed them by.

A number of newer type metals have been developed to fit the bill. All can be depended on to make sound, strong joints in heat-resistant alloys on a production basis.

Try Lithium—Recent research indicates that lithium makes an important contribution to high-temperature brazing. The addition of a small percentage of the metal markedly improves the fluidity and wetting ability of many standard alloys. Thanks to lithium, it is now possible to braze stainless steel in an atmosphere, without flux, at temperatures as low as 1600°F.

A lithium addition of about 0.2 pct is typical. One lithium-sterling silver alloy is gaining favor for brazing honeycomb panels made of 17-7 PH stainless. Its flow temperature corresponds to the temperature for proper heat treatment of this metal. Tensile strength of the joints formed check out at 35,000 to 40,000 psi at 900°F—the maximum service temperature for 17-7.

Penetrates Well—The filler metal

readily wets in vacuum, dry hydrogen, or inert gases, without flux. Because of its high fluidity, it can penetrate small gaps between the components of the brazed sandwich. This adds up to a real improvement over silver-manganese which does not easily wet 17-7 PH.

Joints of sterling-lithium alloy are more corrosion resistant than those of silver-manganese. Thanks to its many advantages, the new alloy has cut the reject rate on brazed honeycomb sections by almost 50 pct.

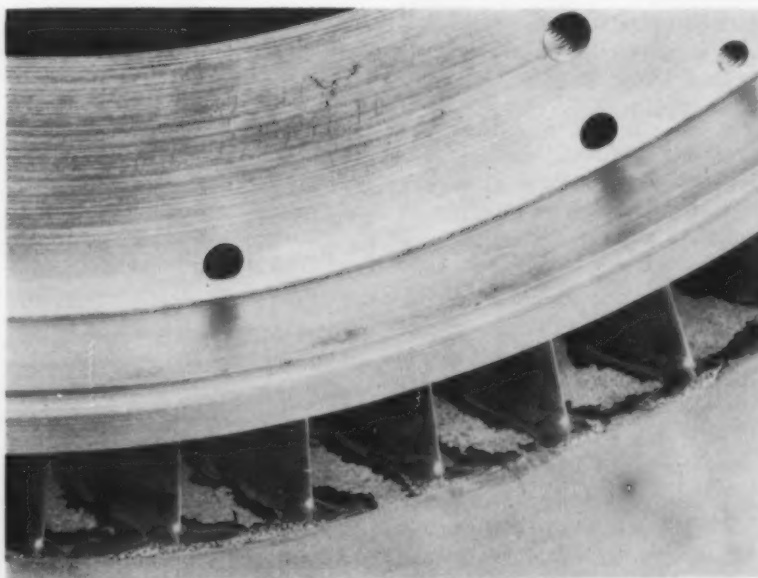
Future Prospects—In certain cases, the high fluidity of the alloy may be a disadvantage. This is true of large, curved surfaces because of excessive run-off of the molten alloy. New developments are now under test to solve the problem. If they work, they may sufficiently cut costs

to make the brazed honeycomb a standard high-strength, light-weight structural material.

Other lithium-containing fillers include the silver-copper eutectic, AMS 4772, and silver-manganese (85-15). These alloys are being used to braze stainless bellows, instrument assemblies, hydraulic lines, and a variety of jet engine parts.

Braze Titanium—A silver-lithium binary containing 2 to 3 pct lithium is still another development. This material can be used to braze titanium and titanium alloys. Peel strength is not yet satisfactory for some applications, but work is under way to improve this property.

Both silver-palladium and silver-palladium-manganese alloys have been used in England and are of experimental interest in the U. S. Palladium additions to silver in-



VANE-AND-SHROUD: The steel in this assembly is a 4130 grade. It was brazed at 2100°F with high-nickel AMS 4775.

crease melting temperature, strength, and ability to wet iron- and nickel-base alloys. Manganese further improves wetting.

Resist Corrosion—These alloys do not penetrate or dissolve the base metal to any extent. Joints are reported to be less susceptible to crevice corrosion attack than those made with silver-manganese alloys. Their resistance to oxidation is like that of other silver-base alloys.

For joining stainless, Inconel, and other heat-resistant alloys, a 70 pct Mn-30 pct Ni filler is being successfully used. It retains much of its high joint strength (as high as 65,000 psi at room temperature) at elevated temperatures. It also offers better oxidation resistance than either Ag-Cu-Li or Ag-Mn fillers.

For Thin Sections—Its properties fall midway between the latter two fillers and the Ni-Cr-Si-B filler metals. In oxidation resistance, it is better than the high-silver fillers. It is not as good as the Ni-Cr-Si-B group. Still, it has much less tendency to dissolve or penetrate the base metal than do the high-nickel alloys. This is an advantage in brazing thin sections.

Preliminary tests with Mn-Ni have shown excellent results. The

material is now being considered for brazing heat exchangers, rocket motor parts, clad metals, and turbine blades. It is now available in either powder or strip.

Combine Hardness, Strength—In the Ni-Si-B and Ni-Cr-Si-B group of alloys, nickel is the main constituent, with silicon and boron as additions. In two of the alloys (including AMS 4775), part of the nickel is replaced with chromium to provide better oxidation and corrosion resistance.

When it comes to retaining hardness and strength in the 1600-1800°F range, these high-nickel materials can't be beat. However, they do attack many base metals by intergranular penetration and solution. Applications for this group include: a vane-and-shroud assembly of 4130 steel brazed at 2100°F, a nozzle assembly of Hastelloy-25 and 304 stainless brazed at 2150°F, and a flat, tubular stainless steel heat exchanger brazed at 1925°F.

Gold Is Used—Gold alloys are useful in cases where intergranular penetration cannot be tolerated and where high strength and good oxidation resistance are needed in the 1600°F temperature range. The high gold content makes these al-

loys expensive on a per-ounce basis. But in most cases the value of the assembly and the importance of reliable high-temperature performance more than justify the cost.

Compared with the high-nickel alloys, the gold alloys have lower hardness, better ductility, and less tendency toward intergranular penetration. They can be made in a variety of wrought forms. In addition, they have excellent wetting and flow characteristics.

Why It Pays—Here are a few examples that account for current interest in Au-Ni-Cr fillers: Lap joints between Inconel and stainless—brazed in a helium atmosphere at 1900°F without flux—were exposed to air at 1600°F for 88 hours with no adverse effect. Photomicrographs of other joints in Inconel and stainless assemblies show only slight grain boundary attack in the stainless. The extent is negligible considering the long brazing cycle employed.

There was no intergranular penetration in the Inconel part of the assembly. These filler metals are also being considered for rocket motor parts, missiles, and nuclear reactors.

Newer Filler Metals for Brazing Heat-Resistant Alloys

Alloy Type	Composition, Pct										Melt, (°F)	Flow, (°F)
	Ag	Au	Pd	Cr	Mn	Cu	Ni	Li	Si	B		
Silver-Copper-Lithium	92.3					7.5		0.2			1435	1635
Silver-Palladium	90.0		10.0								1635	1950
Manganese-Nickel					70.0		30.0				1840	1875
Nickel-Chromium-Silicon-Boron	(Balance Fe)			16.0			72.5		5.0	3.5	1825	1840
Gold-Chromium-Nickel		72.0		6.0			22.0				1765	1835

Spray Unit Speeds Painting Steps

When there's a bottleneck on the painting line, the tendency is to add another booth and put more men on the job.

But if volume production is really the end in mind, electrostatic spraying can be the answer.

■ With each customer specifying and with more than 300 separate colors involved, a gasoline pump manufacturer found the painting de-

partment the bottleneck to increased production. Hand spraying was just not adequate for the job.

To meet the challenge, the pump maker, Bowser, Inc., Ft. Wayne, Ind., modernized by installing a conveyorized electrostatic spray-painting setup along with a new oven. The new facilities double the former rate of 150 units per day with only one shift.

Meets Demand—The one No. 2 Process Ransburg spray unit with a

reciprocating disk paints 55 sets of housings and parts in 1 hour. Formerly, with hand spray and limited oven facilities, the rate was about 15 sets per hour.

Better paint mileage is an added benefit. By hand spraying, the firm painted four sets per gallon. This has been stretched to seven sets per gallon.

There's no need to sand down housings before applying the finish coat. The uniform electrostatic coating makes it unnecessary.

Because no compressed air is used, there's better dust control. Maintenance in the paint area has been reduced 50 pct.

Fast Steps—The 286-ft. conveyor operates from 5 to 8 fpm with the parts hung on 16- or 32-in. centers. The parts first move to a hand touch-up booth, some to be reinforced in recessed areas. As they move into the electrostatic spray area, the floor-mounted 25-in.-diam. Ransburg disk applies primer.

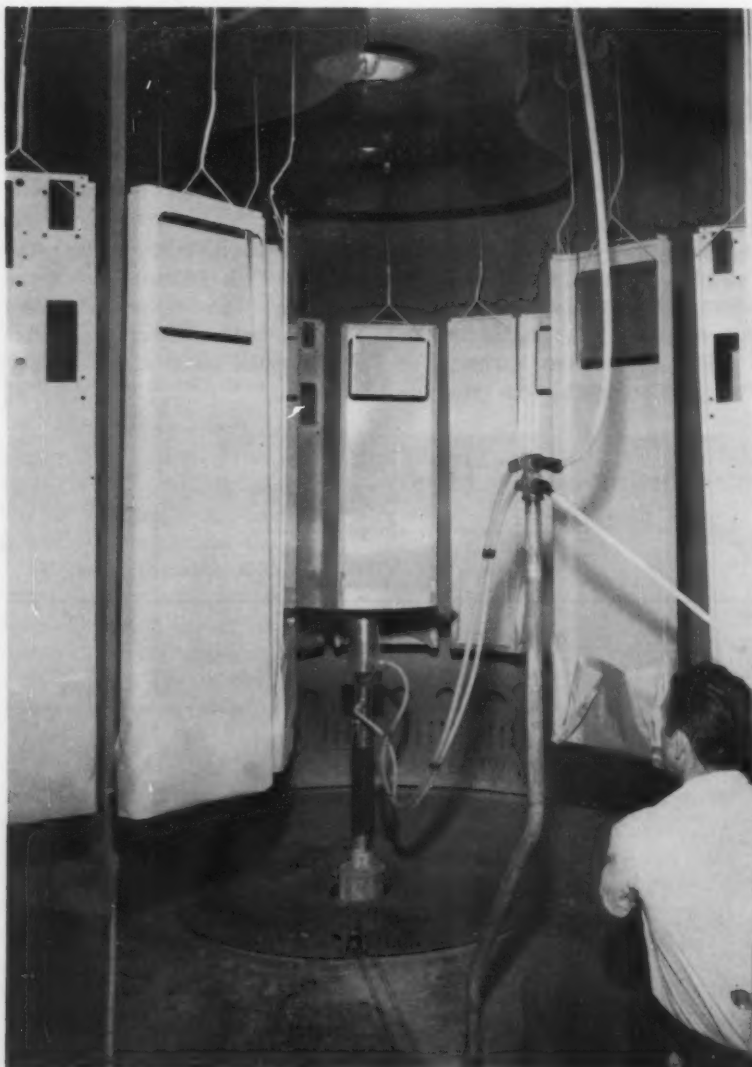
If the color run warrants, parts stay on the line while the paint is changed. The finish coat is applied in the same manner.

Indexers on the conveyor line in the spray area turn the parts for coating of both sides. After painting, parts move into the gas-fired oven where they bake out at 300°F for 15 minutes.

Where production calls for multi-colored pumps, parts are removed from the line after priming and masked before the finish coat is applied.

To insure a finish that will stand rugged service, paint thickness is controlled to within one-half mil over the entire work area. Length of the reciprocating stroke is easily adjustable from 20 to 53 in.

UNIFORM COAT: Looped conveyor carries parts around reciprocating disk. Paint covers 75 pct more surface than with hand method.



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New Catalogues And Bulletins

Test Chambers

Environmental test chambers for research under controlled temperature and humidity conditions for various components and materials are described in a four-page pamphlet. (The Hicks Corp.)

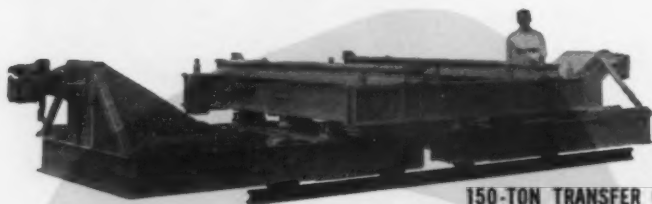
For free copy circle No. 1 on postcard, p. 119

Heat Treating

In addition to describing various types of salt bath furnaces, this 76-page catalog includes technical data

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 119.

on heat treating by the salt bath process. Details cover a variety of work to which the salt bath process applies. (For free copy write on company letterhead to Ajax Electric Co., Philadelphia 23, Pa.)



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Fan Motors

Ranging from 7½ to 100 hp, a line of totally-enclosed motors for propeller and axial-flow fans is the subject of a four-page bulletin. The units are as much as 20 pct smaller and 30 pct lighter than previous models. (General Electric Co.)

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Heating Element

A new wire-mesh surface heating element is designed to be self-mending in the case of damage. Weighing 1/10 lb per sq ft, the 0.012-in. thick element operates at any voltage from 6 v ac to 220 v dc. (Electrofilm Inc.)

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Pushbutton Switches

All-new modular mount lighted pushbuttons are described in an 8-page bulletin. Two built-in indicator lights per unit offer indication flexibility. Two, three, and four-pole units are available. (Micro Switch Div., Minneapolis-Honeywell Regulator Co.)

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Moving Dollies

Heavy-duty moving dollies are outlined in a 4-page bulletin. These dollies have a 100,000-lb load guarantee. (Mighty Mover Co.)

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Openhearth Handlers

Two bulletins describe powerful, efficient materials handlers for openhearth and other uses. These front-end loaders (model 105) can also serve as excavators. (The Eimco Corp.)

For free copy circle No. 6 on postcard, p. 119

Building Sealants

A reference manual covers elastomeric sealants for all types of building applications, from curtain wall to conventional structures. It features case histories on curtain wall installations where elastomeric sealants have been time-tested as the super-bonding medium for

building materials used today.
(Thiokol Chemical Corp.)

For free copy circle No. 7 on postcard, p. 119

Ductile Iron

A case for ductile iron economy is presented in a 12-page booklet. It tells how you may be able to save money by using ductile iron in your products. (T. B. Wood's Sons Co.)

For free copy circle No. 8 on postcard, p. 119

Hardened Ways

Hardened ways and gibs for machine tool builders and guide blocks and wear plates for tool and die users are featured in a 16-page booklet. A section points up the careful means used to produce these hardened products. (Ohio Knife Co.)

For free copy circle No. 9 on postcard, p. 119

Gearmotors

Gearmotors, single phase motors, and a dynamic brake are described in three bulletins. The gearmotors are of the double reduction parallel shaft type. Motors feature high starting torque, low starting current. The brake electrically halts ac motors, using no mechanical means. (Master Electric Co.)

For free copy circle No. 10 on postcard, p. 119

Ceramic Shapes

Diamonite high alumina ceramic rings, tubes and rods are covered in a new catalog price list. (Diamonite Products Mfg. Co.)

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Dust Collector

A 6-page bulletin describes a new aerostatic dust collector. Proven in more than three years of field installations, not one collector has ever been torn down for tube replacement or rebuilding, no matter how severe the service, it reports. (Hagan Chemicals & Controls, Inc.)

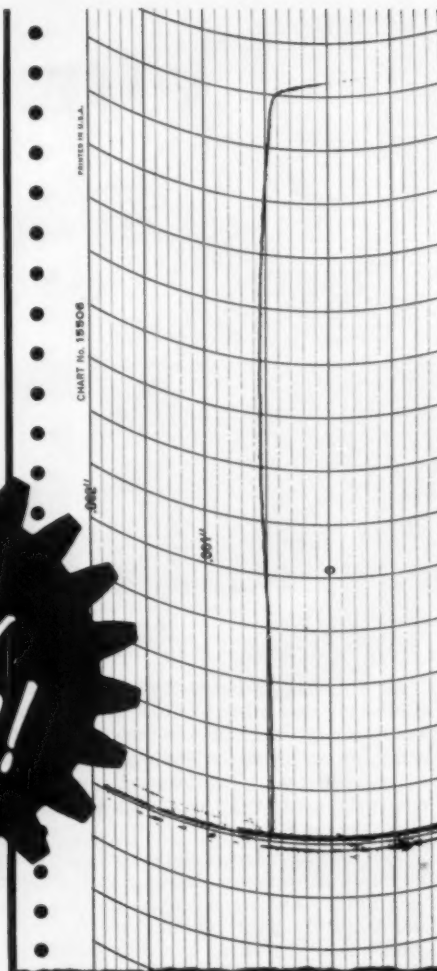
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No-corrode Coatings

Corrosion-proof coatings are discussed in a bulletin. It points out



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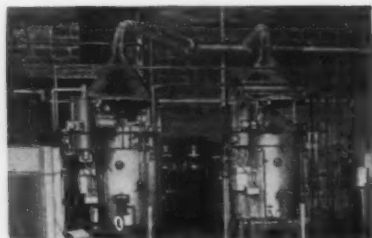
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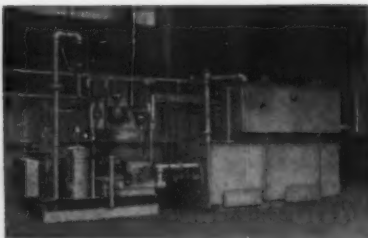
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An EF kerosene exothermic gas generator, built in sizes and types for producing atmospheres for bright annealing copper and steel products in areas where fuel gases are not available.

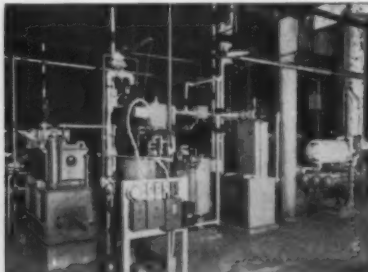
EF engineers pioneered the development and use of endothermic, exothermic and other low cost special atmosphere treatments for bright annealing ferrous and non-ferrous strip, tubing, wire and other products; for scale-free hardening, carbon restoration, decarburizing and other treatments. Get the exact surface characteristics you want, with unvarying uniformity day after day, by specifying EF special atmosphere equipment.

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that no one coating can resist every type of corrosive fumes and splash. Hence, some are better able to withstand abrasion. Choice of the proper coating is important. (Atlas Mineral Products Co.)

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Strip Rolling

Suggestions on rolls for best strip rolling practices are contained in a company's newsletter. It supplies basic information on type of rolls and their uses, selection tips, answers to common roll questions, and maintenance advice. (Fenn Mfg. Co.)

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Flexible Tubing

In 36 pages a booklet reviews all types of flexible tubing and hose. Many coupling types which can be used with the tubing are also covered. It points out the value of proper application of tubing to many different industrial installations. (Pennsylvania Flexible Metal-lic Tubing Co.)

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Throwaway Tools

Throwaway tooling set-up and follow-through operations are discussed in a booklet. It outlines how users may obtain maximum throw-away tooling results through proper use of correct style holders and inserts. (Adamas Carbide Corp.)

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Iron Powder

Sponge iron powder, a raw material for powder metallurgy, is discussed in an 8-page brochure. It covers typical chemical analysis, some important basic and green properties. Presented in graph form are results of tests made on iron mixes, iron-carbon mix, iron-copper mixes and iron-copper-carbon mixes. (Hoeganaes Sponge Iron Corp.)

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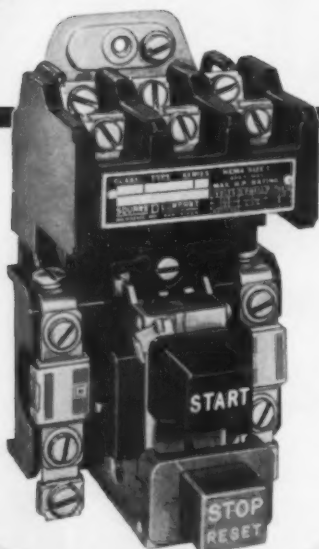
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Electroplating and anodizing conveyors are described in a new bulletin. A special section explains how one operator can control nine or more plating operations. (Hanson-Van Winkle-Munning Co.)

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Sand Reclamation

The operation of a scrubber is fully described in a new bulletin, covering benefits of a sand reclamation system. (Denver Equipment Co.)

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Quiet Transformers

Illustrated bulletin contains charts on average ambient sound level of typical locations and suggests vibration isolating mountings for all available ratings. (General Electric Co.)

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Boiler Cleanings

How many times can metal surfaces be cleaned by chemical means without weakening the metal? A report on the effects of acid cleanings on boilers and process equipment helps answer this question. (Dowell Inc.)

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Finishing Machine

The spindle of the unit rotates large, intricate, or delicate parts in an abrasive mass to get a precision finish. Cycle averages 15 to 20 seconds. (Mecha-Finish Corp.)

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Mercury Switch

A new nylon-enclosed mercury switch resists water, oil, alkalis and acids. Mounting clip data, drawings and electrical rating are included on a data sheet. (Micro Switch, Div. Minneapolis-Honeywell Regulator Co.)

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Motors, Generators

Direct-current motors and generators for industrial and military applications are described in an eight-page bulletin. Engineering service is outlined. (General Electric Co.)

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Non-Coasting Furnace

There's no worry about coasting over with a lining that stores no heat. It's one feature of a new portable furnace for melting or holding all metals. (The Industrial Scale and Equipment Co.)

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Finishing Castings

A new bulletin tells how a large foundry reduced cleaning-room costs with carbon arc-compressed air cutting equipment. (Hobart Bros. Co.)

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covered in a 28-page booklet. Condensed specifications are included in a table. (Linde Co., Div. Union Carbide Corp.)

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They may be the answer in solving your design problems or reducing your assembly costs. Folder contains table of selection and use data. (United Shoe Machinery Corp.)

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Low height-to-width ratio provides a stable base for repetitive precision and semi-finishing work. It's one feature of a single-end precision boring machine covered in a new bulletin. (Olafsson Corp.)

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Milling Machines

Specifications and dimensions of milling machines are shown in a 20-page booklet. Machines are available in 7½-75 hp with table widths varying from 14-38 in. Feed strokes vary from 3-14 ft. (Sundstrand Machine Tool Co.)

For free copy circle No. 35 on postcard

Materials Handling

Two case-history bulletin covering materials handling problems and their solutions are offered. One describes die handling by a plastics manufacturer and the other outlines paper handling by a printer. (Lewis-Shepard Products, Inc.)

For free copy circle No. 36 on postcard

Electric Lift Truck

Fast operation in congested working areas with limited headroom is the feature of a 3000-lb capacity electric-powered fork truck. It's illustrated in a new four-page folder. (Elwell-Parker Electric Co.)

For free copy circle No. 37 on postcard

Safety Equipment

Goggles, respirators, phenolic hats are among the items listed in a descriptive catalog showing a line of personnel safety equipment. (Willson Products Div., Ray-O-Vac Co.)

For free copy circle No. 38 on postcard

White Cast Iron

Facilities for pattern making, casting and quality control at a foundry are covered in a 16-page bulletin which tells the story of the firm's nickel-chromium white cast iron production. (Nordberg Mfg. Co.)

For free copy circle No. 39 on postcard

Sectional V-Belts

A single coil of adjustable-length V-belt often eliminates the needs for stocking many different lengths of the same type. That's what a booklet points out in describing oil-, fire- and heat-resistant grades. (R. & J. Dick Co.)

For free copy circle No. 40 on postcard

Wet Dust Collector

No moving parts, nozzles or pumps is the claim for a new wet dust collector described on a fact sheet. The unit delivers discharge air free of entrained water. (Wheelabrator Corp.)

For free copy circle No. 41 on postcard

Overhead Doors

Combining insulated sandwich construction with weather-proof facing is the feature of one type of overhead door section covered in a new 16-page catalog. (Barber-Colman Co.)

For free copy circle No. 42 on postcard

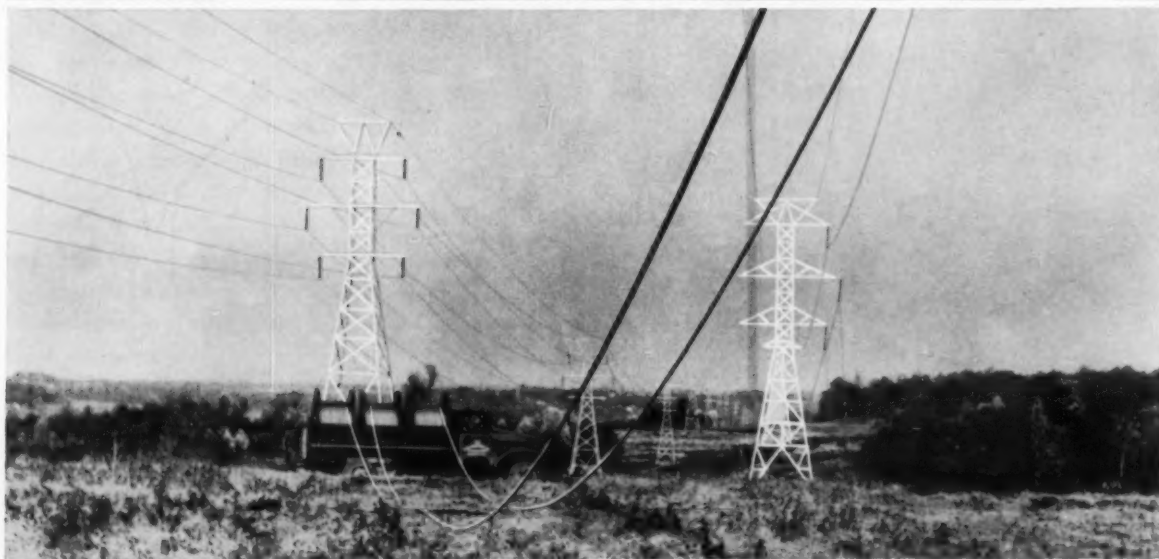
Expanding Mandrels

Precision expanding mandrels in straight jaw, step jaw and miniature types are covered in a brochure. Available sizes are given along with description of special types. (LeCount Tool Works, Inc.)

For free copy circle No. 43 on postcard

The PROOF of DSC STEEL is in its PERFORMANCE

ON YOUR
JOB



▲ Unreeling ACSR cable, view looking west of King's Mountain, S. C.

ACSR INSTALLATION PHOTOS: COURTESY ANACONDA WIRE AND CABLE COMPANY, HASTINGS-ON-HUDSON, N. Y.

▼ Installing ACSR cable, Catskill Mountains, N. Y.

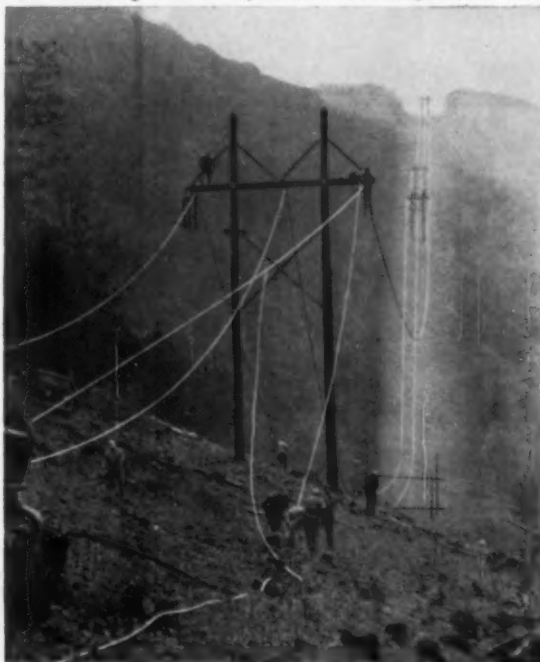
DSC ACSR* Core Wire and Aluminum Cable join strands to cut power transmission costs

Light weight, high current carrying capacity, are engineering and economic advantages of aluminum cable . . . ideal for high-tension overhead power transmission lines.

ACSR cable's ability to support itself over long spans and to resist the destructive forces of temperature extremes, wind, ice and lightning—depends on ACSR Core Wire . . . a hard drawn, high carbon (0.50 to 0.75%), high tensile (190,000 psi min.), heavily zinc-coated Specialty Wire . . . as produced by our Portsmouth Division in accordance with ASTM B 245-55 for major aluminum cable manufacturers.

- * { For the cable fabricator—ACSR means Aluminum Conductors, Steel Reinforced
For the wire producer—ACSR means Aluminum Cable Strand Reinforcement

For more information on ACSR Core Wire . . . or about other DSC Rod and Wire products . . . or DSC Sheet and Strip steel—please write our G.S.O. or call your nearest DSC Customer "Rep" . . . today?



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You Arbitrate It!

AN EMERGENCY CASE?

From the files of
The American Arbitration Association

One September morning a half hour before the start of the 7 o'clock shift, a large sand-mixing machine in a pipe foundry broke down. The maintenance crew got right to work on it. However, by 7:30 it was obvious the machine couldn't be repaired. A new part had to be sent from the manufacturer's plant.

As the machine would take an indefinite number of days to get back into operation, management sent several coremakers home, paying them only for the hour or so they had been standing by.

Union Hops Up—The union had no objection to the layoff. But it felt the men ought to have been paid for 4 hours, in accordance with a call-in pay provision of the contract. This read: "In the event an employee reports for work and works for less than 4 hours because of lack of work he shall receive 4 hours' pay at his regular rate, except in cases of emergency, fire, flood, strikes, acts of God or simi-

lar causes beyond the control of the company."

The dispute obviously turned on whether the machine breakdown constituted an "emergency" within the meaning of the agreement. The company said it certainly was an emergency. "When we can't mix sand we've got to send coremakers as well as molders home or throw the whole balance of the foundry out of whack," the plant manager exclaimed.

Who Said So?—"Not so," answered the union representative. "There was nothing to stop the coremakers from working even though molders had to stop. Cores can be baked and kept for a long period of time without damage. And if you had too many cores you could have transferred coremakers to other jobs."

The Arbitrator Ruled:

The essential point, the arbitrator said, was whether the company could reasonably anticipate repair of the machine "within a fairly short span of time." The company's

evidence convinced him that when the breakdown occurred it was impossible to tell whether it would take one or two weeks to get back into operation. Actually, by getting unusual service from the manufacturer, it was possible to get the part in about 4 days. The arbitrator concluded that "on the basis of the facts available to the company on September 11 an emergency existed which warranted the decision to suspend operations on the core floor and the men were properly compensated." To rule otherwise, he said, would penalize the firm for its extraordinary repair effort.

Caution: The award in this case is not necessarily an indication of how arbitrators might rule in apparently similar disputes. Each case is decided on the basis of the particular history, contract, testimony and other facts involved. Some of these essential details may have been omitted in condensing the original arbitration for brief presentation.

NEW BOOKS

"Materials Handling Applications" offers practical advice and data on improving handling programs at commercial and plant levels. Simple and non-technical in its approach, it supplies basic, how-to information on individual jobs or entire handling programs. 381 pp. 1100 illustrations. \$12.50 per copy. Chilton Co., Book Div., 56th and Chestnut Sts., Philadelphia 39, Pa.

"Top Management Decision Simulation" tells how executives can acquire and develop the skill for making frequent correct decisions without making them at all. Actually, the book explains how management can set up simulated "war games" for executives. 126 pp. \$4.50 per copy. American Management Assn., 1515 Broadway, New York 36.

"Manufacturing Management," by Franklin G. Moore, starts at the beginning instead of the middle. That is, it gives a brief history of management in industry. And it touches (Continued on page 132)

Choice of the wise buyer
who compares...

CM HOISTS

CM METEOR ELECTRIC WIRE ROPE HOIST ½ to 5 ton capacities—Compact, enclosed design. Low headroom. Continuous duty motor with thermal overload protection for heavy duty service. Precision bearings and helical gears for long life. Only 110 volts at push button control. Hook suspension; plain, geared or motor driven trolley.



CM LODESTAR ELECTRIC CHAIN HOIST—¼ to 1 ton capacities—First truly heavy duty version of small electric hoist. ¼ ton model weighs only 51 lbs. Heavy duty self-adjusting brake, plus exclusive regenerative electrical braking. Upper-lower safety limit switches. CM-Alloy load chain. Single and three phase.

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CM makes them all! So you can choose a hoist that's perfectly suited to your specific needs in a compact, rugged and safe CM design.

CM TROLLEYS AND CRANES



CM CYCLONE Hand Chain Hoist—¼ to 10 ton capacities—Easy to carry. One ton model weighs only 36 pounds. Made of tough aluminum alloy. CM-Alloy load chain. High efficiency. Lifetime lubrication.



CM PULLER—"The One Man Gang"—¾ to 6 ton capacities—Lifts or pulls at any angle. Lever handle operation. Automatic load brake holds at any point. ¾ ton model weighs only 13 pounds and fits in a tool box. CM-Alloy load chain.



● **FOR OVER 75 YEARS**, Chisholm-Moore has offered hoist buyers the newest and most efficient designs, the most rugged construction, and the greatest number of valuable operating and safety features. CM hoists operate with a very minimum of maintenance. They give years of satisfying service.

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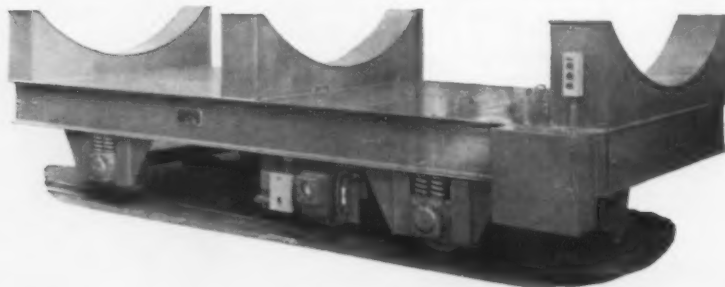
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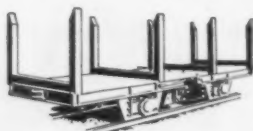
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extra economy



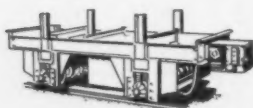
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TECHNICAL BRIEFS

Metallurgy

Analyzers Determine Minute Tungsten Parts in Steel

Tungsten in the range of 2 pct or less is finding increasing application as an alloying element in ferrous metallurgy. This is because it gives durability, hardness and high-temperature properties to steels. Typical alloys incorporating tungsten include non-deforming die and chisel steels, age hardening alloys, tool steels, and certain types of stainless steels.

In producing specific steels, accurate quantitative analysis is neces-



Researcher measures tungsten in steel with a colorimeter.

sary to control manufacturing. Rapid spectrographic procedures serve this purpose only if carefully analyzed reference standards are available for comparisons. However, satisfactory chemical methods for finding small amounts of tungsten in the presence of other elements normally encountered in iron metallurgy have been lacking.

Does Job Well—To meet this

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 119. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

need, National Bureau of Standards researchers have developed a direct photometric method which precisely determines minute quantities of tungsten in steel. It uses a dithiol reagent (1, 2-dithiol-4-methylbenzene). This offers several advantages over previous techniques.

With dithiol, potential metal interferences are eliminated by separation of metal complexes formed with the reagent. Following removal of interfering elements, a clear blue tungsten-dithiol complex forms.

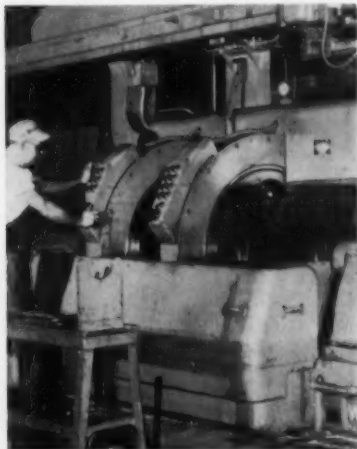
After extraction in butyl acetate a photometer measures absorbancy of this complex which tells the percentage of tungsten present. A single determination can be completed in several hours. A group of six or eight can be made in a day.

Extrusion

Cold forming method results in cheaper titanium parts

Successful cold extrusion of hollow titanium shapes may be a forerunner of economic methods for producing hollow aircraft parts.

Resulting from studies conducted for the Air Force by Battelle Memorial Institute, Columbus, Ohio, the extrusion process makes use of a 700-ton hydraulic press. Metallurgists produced hollow titanium



This lathe removes some 67 lb of metal off the crankshaft.


shapes by forward and backward extrusion. Slugs of 1½-in. unalloyed titanium were backward cold-

extruded in the three-story high hydraulic press to make cups up to 3-inch long with wall thickness down to 0.22 in. This is a 50 pct reduction.

Gives Smooth Finish—In forward extrusion studies, cup-shaped billets with 1½-in. OD and ⅞-in. ID were cold-extruded into cylinders with wall thicknesses down to 0.15 in.


TECHNICAL BRIEFS

Surface finishes were 30 to 60 microinches, equivalent to a smooth turned finish. In addition to providing a finished surface, cold extrusion improves mechanical properties of unalloyed titanium. Increases in tensile strength of 30 pct are reported.



Adaptability

MEANS
MORE
FOR YOUR
MONEY



This makes sense—standard L&J Presses adapted for special jobs. With optional equipment these O.B.I. presses will often do the same work as special purpose machines—and with a much smaller investment. You'll still have the advantage of presses that can handle a greater variety of conventional jobs and with the right speed for each job. It will pay you to write for the facts.

OPTIONAL EQUIPMENT

Air Clutch. Left or right flywheel mounting. Variable speed drive. Automatic feed. Automatic misfeed stop. Accurate top stop. Push button or dial speed controls. Electric speed indicator, J.I.C. wiring. Automatic lubrication. Stroke length and shut height to fit the job. Bronze gibs. Ram counter balances, etc.



Write for new catalog of L&J Presses. Geared and non-geared models—14 to 90 ton capacities. Also, 20 to 150 ton Straight Side Punch Presses.

L & J PRESS CORPORATION
1623 STERLING AVENUE, ELKHART, INDIANA

New Production Ideas

Equipment, Methods and Services



Velocity-power Driver Features Speed, Safety

Speed, simplicity and safety are features of this velocity power driver. The cartridge-activated tool drives headed or threaded studs into concrete or steel. Discharge from a blank cartridge creates driving energy. Loading is safe and easy. The operator merely selects the correct barrel, cartridge, stud

and protective guard; then he slips the preassembled stud and cartridge into the breech. To position for firing, he simply closes the breech by giving the handle a half-turn, counterclockwise. To drive the stud, he pushes the handle forward and pulls the trigger. (Mine Safety Appliances Co.)

For more data circle No. 44 on postcard, p. 119



Tester Checks CO Gas in Exhausts or Rooms

This dual-purpose carbon monoxide checker detects CO concentrations right in engine exhaust streams as well as in room atmospheres. Direct-reading, it shows at a glance whether carbon monoxide is above or below safe concentration levels; it also indicates the approximate percentage concentration. No color-matching or reference to comparator scales is necessary. The device detects CO in the approximate range of 100 to 1000 parts per million. Simplified design results

in rapid tests, easy operation and low initial cost. The detector kit consists of: a pushbutton operated aspirator pump with a connector for holding the detector tube; 24 replaceable sealed glass detector tubes containing a yellow, chemical-gel detector chemical; and six rubber caps for capping detector tubes. Smoke, fumes, and gasses other than carbon monoxide or temperature variations do not affect readings. (Oxy-Catalyst, Inc.)

For more data circle No. 45 on postcard, p. 119



Parts Feeder Deburs Small Metal Stampings

Feeding parts to various production operations isn't the only job this feeding unit performs well. It'll also deburr small metal stampings quickly and semi automatically, using no deburring compounds such as grit or sand. The deburring setup is simple enough. You load parts such as press-punched washers into the unit's bowl. A gentle vibratory action tumbles the parts over each other and around the bowl axis. In a few minutes, parts are completely

deburred. Since no compound is employed, parts can't get contaminated or damaged by fine agents. Handled in mass, parts are deburred without damage. Because the bowl is fabricated of stainless steel (harder than most stampings), its maker feels bowl life should be exceptionally long. The bowl has a manually operated discharge release permitting discharge of parts into a suitable placed container at the end of each job. (Syntron Co.)

For more data circle No. 46 on postcard, p. 119

Circuit Breaker

Electrical circuit breakers in a new line have contacts which are clearly visible. The breakers have removable transparent covers through which you can see at a glance whether contacts are open or closed. Trouble can be spotted instantly. (Standard Control Div., Westinghouse Electric Corp.)

For more data circle No. 47 on postcard, p. 119

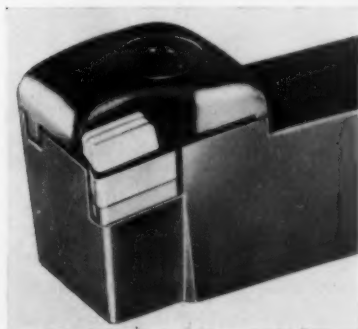
Sintering Plates

Ceramic plates and boats fabricated from a casting ceramic are now being used for critical sintering operations on metals, ferrites, ceramics, glass, and cermets at temperatures of 3000°F. The plates and boats meet important criteria for most sintering operations: (1) purity of material, so that the tooling will not contaminate the powders which are being sintered; (2) heat resistance to temperatures up to 3000°F; (3) extreme resistance to thermal shock. (Duramic Products, Inc.)

For more data circle No. 48 on postcard, p. 119

Carbide Tool Holder

Carbide cutting edges are changed without removing the chip breaker in this throwaway-type tool holder. The chip breaker, seating in a re-



cess, is easily replaced. Lack of protruding parts enables two or more tool holders to be clamped together. (Sandvik Steel, Inc.)

For more data circle No. 49 on postcard, p. 119

Sheet Piler

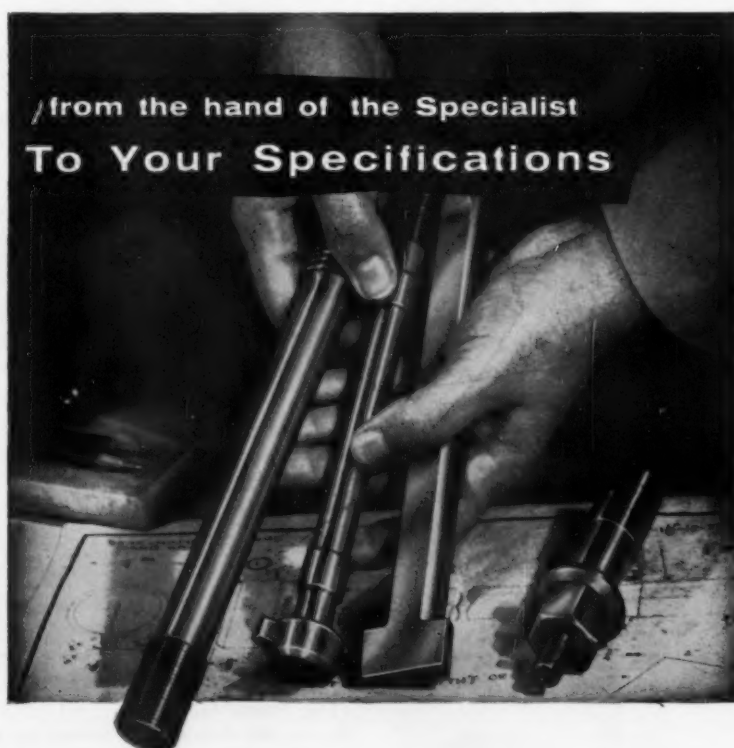
Sturdy and compact, an automatic reversible sheet piler handles

a wide range of sheet lengths and widths. For mill, warehouse or shop use, it works like this: A sheet runs onto the roller equipped unit from a mill exit table or a processing line, a shear line or a conveyor. As the sheet reaches the piler's end, it tips off the table and slides down onto a uniform pile. A manual or automatic switch permits stacking on the other side with no interruption of sheet flow. (The Guide Co.)

For more data circle No. 50 on postcard, p. 119

Turret Lathe Control

A control unit performs automatically turret lathe functions heretofore done by hand. Any turret lathe using it can operate three ways: fully automatic, semi-automatic or completely manual. When the unit goes into operation the operator is free to perform other activities. Every finished piece is identical because the lathe doesn't vary as in manual operation. Hand or automatic operation, forward or



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Only the hands of the specialist can produce fasteners which will meet your design and engineering specifications with precise accuracy. Erie has been doing just that for more than 40 years . . . producing to customer specifications bolts, studs, cap screws and nuts for use in extreme temperature, corrosion and tensile applications for a wide diversity of industries. Submit your specifications to us with confidence.



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Erie, Pennsylvania
Representatives in Principal Cities

NEW EQUIPMENT

reverse spindle rotation, open or close collet, low or high clutch, hexagon turret and cross slide jog forward or reverse, at feed or rapid traverse, cycle start and stop, emergency stop and hydraulic pump are all controlled from the single control panel. (The De Silvey Corp.)

For more data circle No. 51 on postcard, p. 119

High-lifting Truck

Thanks to recently developed lift channels a new truck can take a 4000-lb load off a 30-ft pile, lower it at a rapid rate, quickly move it to another place, and shoot it up on top of another 30-ft pile. Applicable to one manufacturer's 10,000-lb gasoline powered trucks, the extra high channels have an over-all collapsed height of 220 in. They are similar in appearance and basic operation to the maker's standard roller channels operating with a simplex lifting cylinder. Despite the great distance travelled, lifting



speeds of 20 fpm loaded and 21 fpm empty are possible. Lowering speeds are 31 fpm loaded and 20 fpm empty. In developing the 30-ft lift, engineers also determined higher load capacities for lower lifted heights with the channels. Typical of these are 5300 lb to a 300-in. height, 6600 lb to 240 in., and 8000 lb to 180 in. The lift's great height

allows wide spacing of channel rollers and effective channel bracing for rigidity through its full range. (Yale & Towne Mfg. Co.)

For more data circle No. 52 on postcard, p. 119

Tight-turning Handler

In foundries, shops and plants where floor space and money are synonymous, one way to waste both is to reserve large areas for materials handlers to turn. A new



front end loader (2500-lb capacity) with an extremely short turning radius lets such space serve more valuable production operations. Rubber tired, the tractor shovel has a 6-ft to the outside rear hub turning radius. It can work in and out of boxcars having 6-ft doors. Power steering as a standard feature assists both maneuverability and handling ease. The unit uses a new power-shift transmission and new torque converter. The two-speed transmission is full reversing. (The Frank G. Hough Co.)

For more data circle No. 53 on postcard, p. 119

Ultrasonic Cleaner

A new unit cleans small parts and assemblies with ease. Constructed of stainless steel and weighing 53 lb, the unit accommodates parts up to 10-in. long. Both an ultrasonic chamber and a rinse basin are provided. The unit features one dial tuning. (Lawrence Mfg. Corp.)

For more data circle No. 54 on postcard, p. 119

Metal Powder Press

A new high-speed automatic press produces small metal and ceramic powder parts. Featuring a maximum 2-tons pressure, the

press works at 27 to 84 strokes per minute, handling up to 1/2-in diam parts. Driven by a 1/2-hp motor with variable speed drive, the unit is 43 in. high, weighing 650 lb. The press has an easily removable self aligning toolholder to accommodate conventional punches, dies and core rods. Pressing tools are mounted and aligned in the toolholder outside of the machine and can be exchanged with hardly no down-time of the machine by using an additional toolholder. (Arnhold Ceramics, Inc.)

For more data circle No. 55 on postcard, p. 119

Hand Tapper

Precision threads in a size range from No. 0 to 1/2 in. are produced by this tapper. Designed as an accessory for drill presses, lathes, jig borers and vertical millers, the tapper can eliminate individual hand tapping machines and devices. It also enables tapping work "on location" where drilling takes place.



This insures accurate tap alignment with the drilled hole. And it can save considerable time sometimes spent moving work to a tapping machine and aligning it. Basically, the tool consists of an adjustable, floating tap holder with a 1/2-in. diam free turning spindle shaft. (Grimes Engineering Corp.)

For more data circle No. 56 on postcard, p. 119

Boiler Tube Expander

This automatic tube expander can make boiler production more efficient and cut users' maintenance

PROFILE

ACCENT

VISTA

SHORELINE

Legendary Beauty

with the carefree luster and practicality
of solid

Superior Stainless

STRIP STEELS

With fine American-made flatware made of Superior Stainless Strip Steel, you enjoy the soft highlights and satin-smooth finish that are traditional in finest table services . . . plus the hard, tough, mar-resistant strength of quality stainless steel, good for generations of everyday use! Superior Stainless meets the standards of America's foremost tableware fabricators. Let us check with you on your own special needs.



Superior Steel

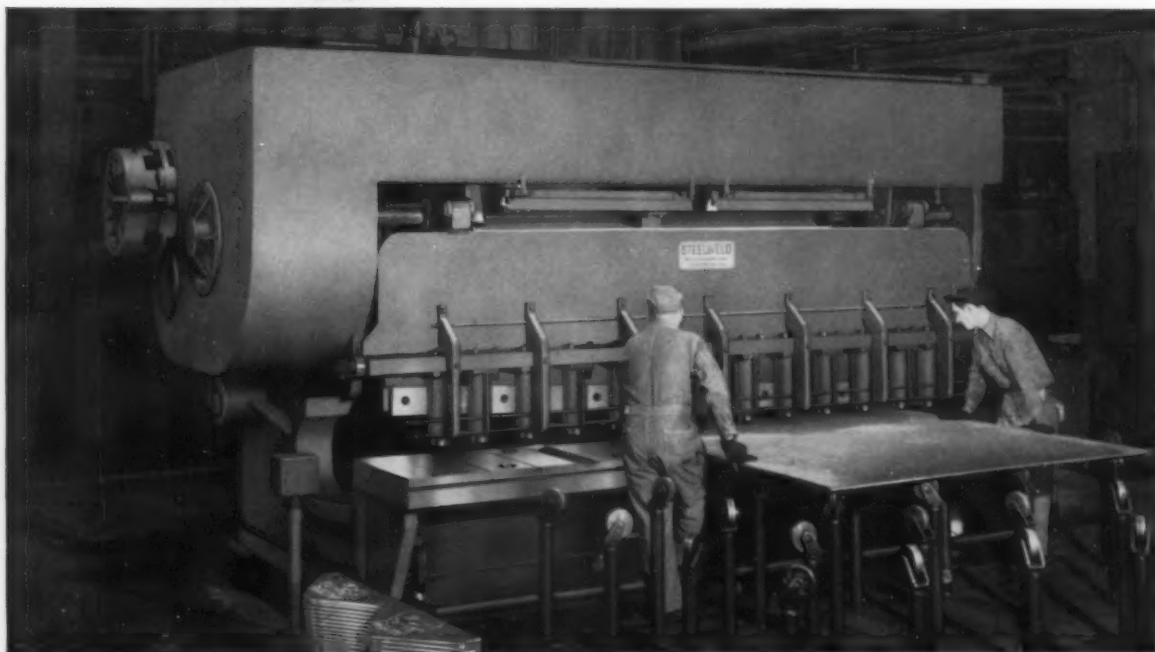
DIVISION OF
COPPERWELD STEEL COMPANY
CARNEGIE, PENNSYLVANIA

For Export: Copperweld Steel International Company, New York

The stainless steel
flatware illustrated is
produced by
ONEIDA, LTD.,
Oneida, New York



Better Cuts Make Better Fits for Road Machinery Builder



This rugged machine is in service two shifts — 16 hours a day — five days a week shearing parts of various thick-

nesses and shapes for heavy earth-moving equipment. It is rated for mild steel 12' x 1".

THE ease with which good, square, accurate cuts are obtained has made the Steelweld Shear of a road machinery manufacturer very popular with the operators and shop management.

Experienced with various type shears, they know the importance of easy knife clearance adjustment. They know that the best cuts are obtained when the correct clearance is provided for each thickness of plate being cut. As they point out, improper knife clearance on any shear often results in a heavy plate being cut at an angle with respect to the thickness, or light gauge metal burring.

Adjusting knife clearance on Steelweld Shears

is such an easy, quickly-performed task that operators take care of it automatically. Turning a hand crank until a gauge pointer is on the proper metal-thickness figure is all that is necessary — a task done in a matter of seconds.

The big time saving made on knife changing as compared with most shears is another factor greatly appreciated. Easily done in two hours on a Steelweld, this job frequently requires all day on other machines.

Steelweld's unusual pivoted-blade operating principle makes possible outstanding cost-cutting advantages. For the complete story, send for the catalog below.



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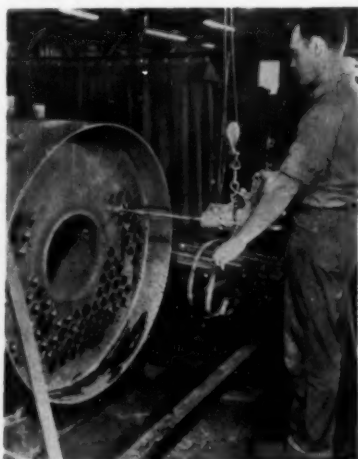
CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

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4840 East 282 Street, Wickliffe, Ohio

STEELWELD PIVOTED BLADE SHEARS

costs. Available to manufacturers of package-type, fire tube boilers, the air-driven tool eliminates variables caused by over- or under-rolling. This assures uniform distribution of expansion stresses throughout tube sheet when a boiler is in operation. In use, a worker sets the tool's calibrated dial, which reads torque in



foot pounds, at the desired tightness. When this point is reached, the expander control automatically stops rotation. All tubes thus are rolled uniformly, distributing pressures equally throughout the tube and tube-sheet bearing surfaces of each tube. (Thomas C. Wilson, Inc.)

For more data circle No. 57 on postcard, p. 119

Dial Indicators

Dial indicators now available feature jewel bearings for added accu-



racy. However, they can be supplied with plain bearings when so speci-

All 2¼-in. diam in size, the indicators are conservative in design, smooth in action, and long lasting. Dimensions are in accordance with American Gage Design Committee specifications. Thus, they interchange with other makes of similar size. (SEMA Corp.)

For more data circle No. 58 on postcard, p. 119

Plating Agent

A new leveling and grain refining agent for cadmium plating solutions

NEW EQUIPMENT

produces semi-bright deposits. This agent modifies the grain structure of cadmium plate to afford uniform results with chromate conversion coatings. It gives bright uniform results with dilute one-dip treatments. The agent eliminates cloudy effects associated with this bright dipping. (Conversion Chemical Corp.)

For more data circle No. 59 on postcard, p. 119

SR ... the dc rectifier type welder with new completely sealed semimetallic rectifier, new transformer and new weld stabilized circuit. Result is easiest arc starting ever, maximum arc stability, sounder, denser welds; current that handles all electrodes in all positions! Four models, 200 to 600 amps.

SRH ... the same revolutionary improvements that set the Gold Star SR above and beyond the performance standards ever before achieved by a dc rectifier type welder. Designed primarily for compactness, the SRH is only 30¼" high — is ideally suited for stacking or paralleling in minimum space. Three models, 200 to 400 amps.

300 ... combination ac, dc welder design comes of age with this new Miller model. Features: new magnetic amplifier circuit; improved wave form; new arc starting control; three electrically controlled current ranges for finest adjustment; instant changeover from ac to dc; built-in high frequency. An entirely fresh concept for inert gas and metallic welding. Four basic models with kits available to convert to seven different types of welders.

300-M ... an ac welder for inert gas and metallic arc processes. Combines unequalled welding characteristics with Miller's unique electric control circuit which permits precise slow or fast start. Features: built-in high frequency, primary contactor and ½ KVA control transformer. Offered in three basic models of from 200 to 400 amperes with optional water and gas controls available.

Complete particulars on any of the above welders will be sent promptly.

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NEW BOOKS

(Continued from page 123)

on the backgrounds of present problems. Then it goes on to explain how you can solve your own management problems. Text on capital investment, operations research, linear programming, computers and cost control attempts to get the reader to solve his own puzzles. 843 pp. \$8.35 per copy. Richard D. Irwin, Inc., Homewood, Ill.

"1958 Manufacturers' Agents Guide" lists more than 10,000 firms who distribute their products through agents. It's classified by industry. 150 pp. \$10 per copy. Manufacturers' Agent Publishing Co., 505 Fifth Ave., New York 17.

"History of the British Iron and Steel Industry" is colorful and somewhat unusual. Though it reviews considerable technical data, this information has very little economic

use to today's metalworkers. Rather, the work is basically historical; however, it's interesting and supplies some facts little known to American metals men: notably, that the industry was already ancient in Britain long before the U. S. industry was even conceived. It traces installations from 400 B. C. up to 1775 A. D., which is when many of us begin to trace our own histories. 445 pp. \$12 per copy. The Macmillan Co., 60 Fifth Ave., New York 11.

"Successful Industrial Selling" can be used two ways. First, it provides a seller with ammunition to use on industrial purchasing agents. Second, it has obvious uses for those same purchasing agents. It's not an A-B-C lesson in high pressure tactics, though. Rather, it tells sales people how to best serve the needs and wants of industrial customers. 256 pp. Prentice-Hall, Inc., Englewood Cliffs, N. J.

"Hot Dip Galvanizing 1956" contains the edited proceedings of the Fourth International Galvanizing Conference held in Milan in 1956. It's aimed not just at galvanizers, but also at all who use zinc or steel. 232 pp. Zinc Development Assn., 34 Berkeley Sq., London W. 1, England.

"Public Relations Practices," a comparative study of the practices in six industrial corporations, is a new work by F. Rhodes Henderer, Staff Director, Public Relations Research, United States Steel Corp. The study results in the uncovering of eight fundamental categories common to each of the differing companies. 232 pp. University of Pittsburgh Press.

"Automation & Management" asks a startling question of small shops who envy giant assembly plants turning out finished pieces from raw stock. This is: Why automate anyway? Automation does have disadvantages, too. It's not a negative work though. More than ample space expounds automation's



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assets to the shop, the plant, the individual and mankind in general. Most important, it tells how manufacturing managers can benefit best by planning automated systems carefully, considering mechanical, marketing, and labor relations implications. 270 pp. \$10 per copy. Research Div., Harvard Business School, Soldiers Field, Boston 63, Mass.

"Markings for Identifying Grinding Wheels & Other Bonded Abrasives" is a new American standard. 8 pp. \$1 per copy. ASA B5.17-1958. American Society of Mechanical Engineers, 29 W. 39th St., New York 18.

"Handbook of Layout & Dimensioning for Production" basically assumes that all good design is developed graphically, that it must be based on proper dimensioning and tolerancing. You get this from its 600 some illustrations which take the reader through each step in layout and design practices. 479 pp. \$15 per copy. The Macmillan Co., 60 Fifth Ave., New York 11.

"Fatigue of Aircraft Structures" concludes you can test and re-test all components in an aircraft and still not know what's going to happen in actual flight. Only by testing a complete structure can you be pretty sure of what's going to happen. It goes on to discuss component tests anyway. 104 pp. \$2.75 per copy. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.

"The Swiss Automatic" tells how you can automatically machine high-precision parts using Swiss methods of cam design and production. 285 pp. \$12 per copy. Bechler Service Corp., 28 Harbor St., Stamford, Conn.

"Engineering Materials Handbook" considers materials from the viewpoint of engineering structures, machinery and equipment. In 43 sections, it covers: metals, organic and inorganic materials, causes of

failure of such matter, and prevention of failure. 1936 pp. 648 illustrations. \$21.50 per copy. McGraw Hill Book Co., 327 W. 41st St., New York 36.

"Papers on Metals" contains 11 papers on a wide range of metal topics. They include: stainless columns, shotpeening, forming, fatigue of heat-resistant alloys, high-strength steels, high-purity aluminum, magnesium alloy, beryllium

copper, and aluminum corrosion. 182 pp. \$4.50 per copy. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.

"Iron Castings" compresses all ASTM standards into one volume. Gray, nodular and malleable castings; cast pipe; pig iron; and welding rods and electrodes are covered. 168 pp. \$2.75 per copy. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.



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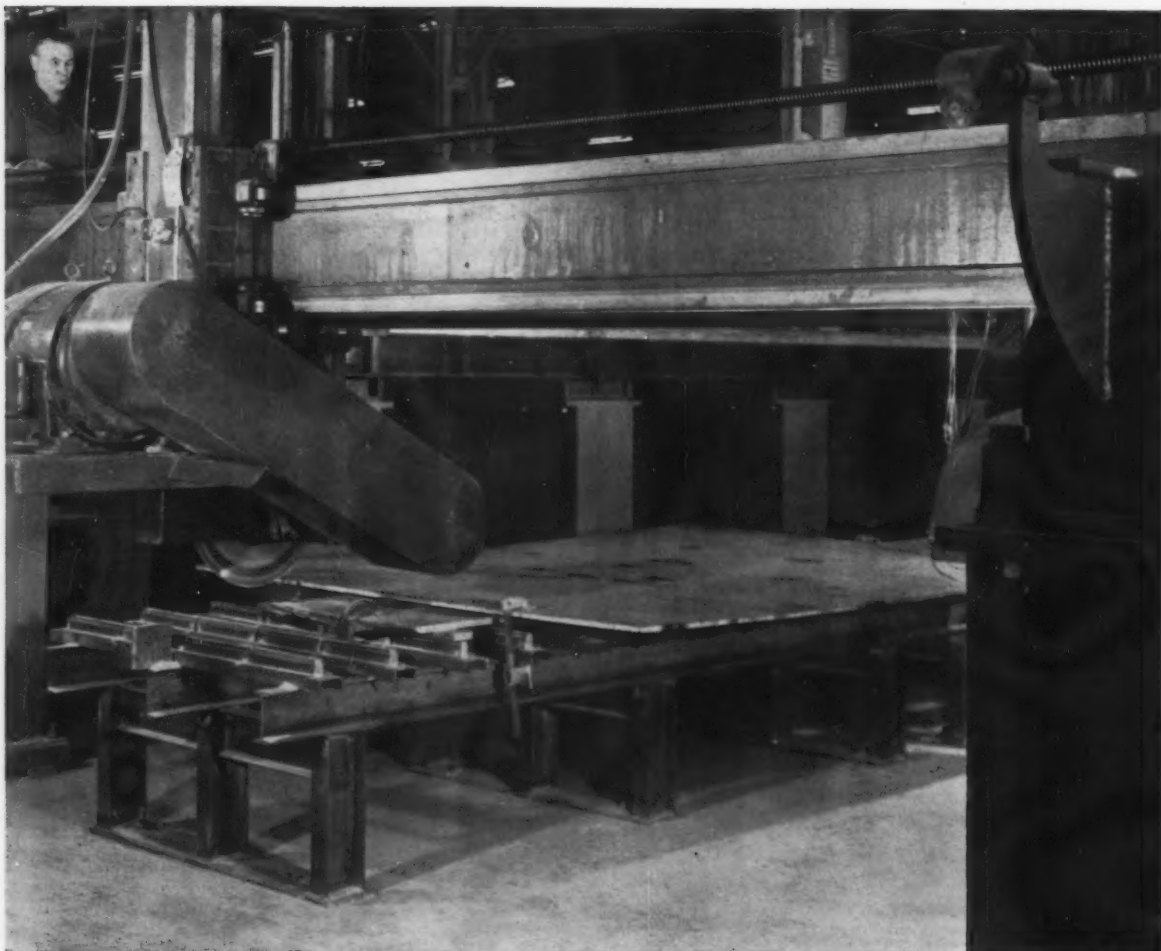
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The Iron Age Summary

Will April Be Steel Turning Point?

When the figures for '58 are in, one major mill feels April will have been turning point.

The market is getting an assist from construction. Auto demand outlook improves.

■ Will April prove to be the turning point in this year's depressed steel market?

At least one major steel mill believes this will turn out to be the case when the final figures are in for 1958. This mill reports that the drop in shipments was checked in April. And it adds that bookings at the start of May were slightly higher than they had been a month ago.

Grasping at Straws?—This could be considered grasping at straws. But at the moment it's one of a few bright spots in an otherwise drab market picture.

Another optimistic note is that the mills are getting more support from construction. The biggest improvement in the market seems to

be coming from plates, structurals, and other products that go into construction. The situation is not uniform throughout the country as yet, but construction usually moves ahead at this time of year.

Railroad Buying Hinted—Another shot-in-the-arm could come from the railroads if they get the help they have been asking for. One major railroad asserts that if help is forthcoming it would plan to spend \$100 million almost immediately for capital goods. The railroads are big users of steel when they are in a position to buy.

The word from Detroit is none too cheering. But there are signs that automotive steel inventories have hit rock bottom.

The Big Shuffle—The Big Three automakers are said to be shuffling steel between plants to balance inventories as they move toward the phase-out stages of the current model production year. There is less talk of the auto companies living off their inventories.

It is pretty generally agreed in Detroit that when the time comes to turn out new cars, the car companies will have to order steel to meet their needs. They won't be using more than they are buying.

It Figures—This size-up of the Detroit picture is pretty much in line with the latest inventory analysis of several major steel firms. (See page 62.) This analysis indicates that on the basis of increasing volume of rush orders steel stocks are nearing rock bottom.

Bar orders, usually a good barometer of overall market strength, are up slightly in some steelmaking centers, but not enough to show a trend.

Price Hedging—Some steel users are talking about laying in some stock as a hedge against a probable price increase as a result of higher steel wages scheduled for July 1. In the absence of a strike threat, this price hedging probably won't be too significant. But as one steel man puts it: "Every little bit helps."

Steel Output, Operating Rates

	This Week	Last Week	Month Ago	Year Ago
Production				
(Net tons, 000 omitted)	1,350	1,289	1,308	2,240
Ingot Index				
(1947-1949=100)	84.0	80.2	81.4	139.4
Operating Rates				
Chicago	56.0	55.0*	55.0	85.0
Pittsburgh	51.5	50.0*	48.5	92.0
Philadelphia	55.0	59.0*	50.5	102.0
Valley	39.5	36.0*	37.5	78.0
West	69.5	70.0*	67.5	103.5
Cleveland	29.0	29.5*	31.0	86.5
Buffalo	34.5	34.5	39.0	85.5
Detroit	35.0	12.0	13.0	87.0
South	65.0	60.0	47.5	95.5
South Ohio River	29.0	28.0*	41.0	70.0
Upper Ohio River	69.5	62.0*	73.0	84.0
St. Louis	76.0	75.0*	59.0	84.0
Northeast	31.0	31.0	31.0	63.0
Aggregate	...	47.8	48.5	87.5

*Revised

Prices At a Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.670
Pig Iron (Gross ton)	\$66.49	\$66.49	\$66.49	\$66.56
Scrap, No. 1 hvy (Gross Ton)	\$32.00	\$31.50	\$33.50	\$44.17
No. 2 bundles	\$23.17	\$22.83	\$24.83	\$37.17
Nonferrous				
Aluminum ingot	26.10	26.10	26.10	27.10
Copper, electrolytic	25.00	25.00	25.00	32.00
Lead, St. Louis	11.80	11.80	11.80	15.80
Magnesium ingot	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	94.00	94.25	92.00	98.50
Zinc, E. St. Louis	10.00	10.00	10.00	12.00

Gears Will Remain Buyers Market

Buying conditions are fine for purchasers of mechanical drives.

Manufacturers are caught in squeeze between slipping sales and rising costs.

■ Makers of mechanical drives are caught between slipping sales and rising costs.

It's doubtful, however, that buyers will be able to take advantage of any competitive price cutting. Gearmakers are not likely to shave prices to boost sales as some did in 1957.

Wage Talks Begin—The manufacturers are currently starting preliminary wage talks with industry union leaders. More discussions are scheduled for this spring and summer. There's a strong prospect that

wage increases such as those given the steel and foundry industries will be granted.

Under these circumstances suppliers will find it difficult to make price concessions. They may even be forced to boost prices if they have already trimmed back profit margins too far.

So the general advice to prospective customers: If you need gears, buy now.

Deliveries Favorable—The delivery picture for gears also favors purchasers. They are expected to be easily obtainable for the next six months or longer. Sales of gears dropped 3 pct in March, falling below the entire first quarter average. They will probably continue falling during the second quarter.

Precision gears and drives, chiefly for defense contract work rather

than the commercial market, are making a slightly better showing. A few shops leaning heavily to precision output are actually running at year-ago levels. But, even with the letting of additional defense work, gear producers are not overly optimistic about the second and third quarter outlook.

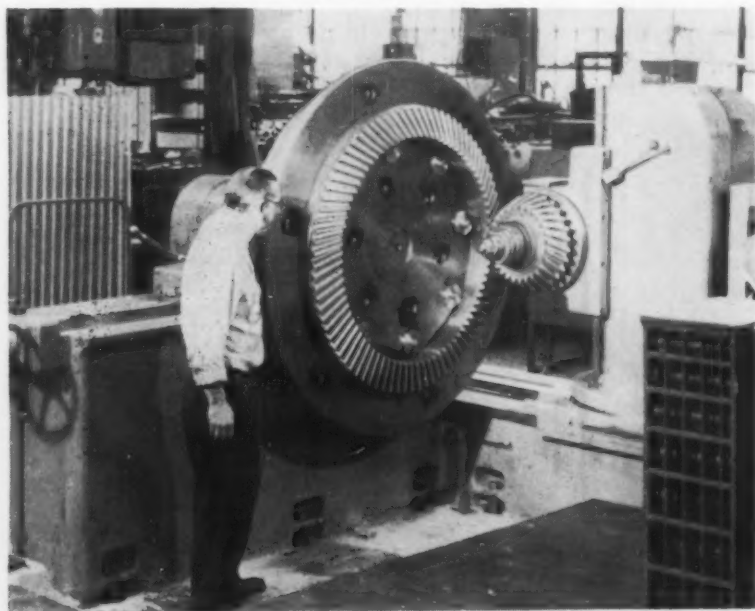
Help From Uncle?—Manufacturers are hopeful some federal action on fast depreciation might encourage equipment makers to increase purchases. One producer puts it this way: "Understand, I'm not saying anybody has gone to the wall yet. But, unless somebody kicks this thing along, I'm confident that some of the smaller shops will have to close their doors. They can't take this kind of beating much longer."

The picture varies widely with individual companies. As had been expected, a number of firms did very well in the fourth quarter of last year. One gear manufacturer reports December 1957 was his best month of the entire year. Similar reports have come from belting and hydraulic drive concerns.

Turbine Price Increases

General Electric Company has announced price increases of 3 pct on the products of four departments of its turbine division.

The boosts will affect all steam turbine-generator units manufactured in Schenectady, N. Y., and in Lynn, and Fitchburg, Mass., marine propulsion and gear units manufactured in Lynn; mechanical-drive turbine and ship service turbine-generator sets manufactured in Fitchburg; and gas turbines manufactured in Schenectady.



GEAR TESTING: Angular tester installed in Brad Foote Gear Works, Cicero, Ill., tests spiral bevel, spur, helical and internal gears.



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Structural Sales Add Life to Dull Market

While most other products remain weak, structural bookings continue improving.

Fabricators and warehouses are among buyers helping fill out mill order books.

■ Demand for heavy steel products—especially structurals—continues to prop up an otherwise weak market.

While the search for a pickup in other products goes on, bookings of structurals have improved. Wide flange beams are showing the biggest gain. But orders for standards are also better. And the overall market picture for both plate and structurals is brighter.

Fabricators are one source of the new life in structurals. Their shipments of completed work remain at high levels. As a result they find it necessary to boost mill orders for steel.

Seasonal Support Helps—Warehouses, too, are more active in buying. Generally they are holding the line on purchasing other products for stock. The exception is structurals which they are ordering to re-fill inventory gaps.

Seasonal support from the construction industry will help the heavy steel market retain or improve its gains. Normally steel consumption in the second and third quarter is about two million tons more than in the first. Plates and shapes are an important part of that increase.

Correction—The statement on this page last week that "Lukens Steel Co., only remaining premium

alloy plate producer in the East, reduced its price \$6 a ton down to the level of other mills in the area" was incorrect. Lukens has never charged a premium on alloy plate, but only on a proprietary high strength, low alloy plate. This product was the one lowered in price to that of other suppliers.

Sheet and Strip—Some mills are booking more tonnage for June than they are for May. Customers evidently want to get orders in before any price changes at midyear. Another indication of coming activity: Steel salesmen servicing automotive accounts are urging buyers to order early for late summer delivery. They warn that getting automotive quality sheet will require good lead time.

At present **Detroit** steel users are shuffling steel between plants to balance out inventories before re-ordering for the '59 models. Other customer are buying spasmodically. Orders come in at a good level for a few days, then tapered off.

The **Cleveland** Works of Jones & Laughlin, a major source of sheet, will not reopen until business picks up, according to J&L. The plant has been closed since Febru-

PURCHASING AGENT'S CHECKLIST

Stage is set for upturn in steel order pace. **P. 62**

Appliance makers banking on boom in next few years. **P. 66**

Age of super-electrified machine tools forecast. **P. 136**

ary for modernization and expansion now completed.

Bar—**Midwest** mills report a mild pickup in hot-rolled bar orders. Described as responsible are increased buying by farm equipment makers and warehouses. Cold finished bar is not sharing in the gains. Inventory stocks of cold finishers are still heavy. Buyers know they can get fast delivery whenever they need it. However, cold finished isn't losing any of the limited gains it made in March. The March level of business continues.

Pipe and Tubing—April shipments of oil country seamless at one **Pittsburgh** area mill were above those for March. Mill salesmen handling oil country accounts say customers are more optimistic. Most buying areas are showing more activity, with the exception of Texas and California. Export demand is slipping off a bit.

A new continuous butt-weld pipe mill will be constructed at Lorain, O., works of National Tube Div. of U. S. Steel.

Stainless—Lagging automotive demand and inventory cuts by warehouses are not doing the market any good. April shipments showed little change from March. This month is expected to stay at the same level. Producers believe users will need to rebuild stocks soon. However, mills are still waiting for the orders which will prove them right.

Pig Iron—Imports arriving by boat in the **Cleveland** district are apparently destined for southern Ohio and Pittsburgh area mills. Other pig iron is being shipped in from New York mills by water with later rail delivery to Ohio inland ports.

Warehouses—Distributor inventories still remain high. Warehouses have pushed back or cancelled mill orders for steel, but not fast enough to keep up with falling sales. Structurals are the only product on which they are making no effort to trim stocks.

COMPARISON OF PRICES

(Effective May 6, 1958)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	May 6 1958	Apr. 29 1958	Apr. 8 1958	May 7 1957
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925¢	4.925¢	4.925¢	4.675¢
Cold-rolled sheets	6.05	6.05	6.05	5.75
Galvanized sheets (10 ga.)	6.60	6.60	6.60	6.30
Hot-rolled strip	4.925	4.925	4.925	4.675
Cold-rolled strip	7.17	7.17	7.17	6.870
Plate	5.12	5.12	5.12	4.87
Plates, wrought iron	13.15	13.15	13.15	10.40
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	50.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	\$10.30	\$10.30	\$10.30	
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	9.00
Special coated mfg. ternes	9.55	9.55	9.55	9.55
Bars and Shapes: (per pound)				
Merchant bar	5.425¢	5.425¢	5.425¢	5.075¢
Cold finished bars	7.30	7.30	7.30	6.85
Alloy bars	6.475	6.475	6.475	6.125
Structural shapes	5.275	5.275	5.275	5.00
Stainless bars (No. 302)	45.00	45.00	45.00	43.25
Wrought iron bars	14.45	14.45	14.45	11.50
Wire: (per pound)				
Bright wire	7.65¢	7.65¢	7.65¢	7.20¢
Rails: (per 100 lb.)				
Heavy rails	\$5.525	\$5.525	\$5.525	\$5.275
Light rails	6.50	6.50	6.50	6.25
Semi-finished Steel: (per net ton)				
Re-rolling billets	\$77.50	\$77.50	\$77.50	\$74.00
Slabs, re-rolling	77.50	77.50	77.50	74.00
Forging billets	96.00	96.00	96.00	91.50
Alloy blooms, billets, slabs	114.00	114.00	114.00	107.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.15¢	6.15¢	6.15¢	5.80¢
Skelp	4.875	4.875	4.875	4.225
Finished Steel Composite: (per pound)				
Base price	5.967¢	5.967¢	5.967¢	5.670¢

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

	May 6 1958	April 29 1958	April 8 1958	May 7 1957
Pig Iron: (per gross ton)				
Foundry del'd Phila.	\$70.97	\$70.97	\$70.97	\$68.88
Foundry, Valley	66.50	66.50	66.50	65.00
Foundry, Southern Cin'ti	73.87	73.87	73.87	67.17
Foundry, Birmingham	62.50	62.50	62.50	59.00
Foundry, Chicago	66.50	66.50	66.50	65.00
Basic, del'd Philadelphia	70.47	70.47	70.47	68.38
Basic, Valley furnace	66.00	66.00	66.00	64.50
Malleable, Chicago	66.50	66.50	66.50	65.00
Malleable, Valley	66.50	66.50	66.50	65.00
Ferromanganese 74-76 pct Mn, cents per lb	12.25	12.25	12.25	12.75

Pig Iron Composite: (per gross ton)				
Pig iron	\$66.49	\$66.49	\$66.49	\$64.56

Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	\$32.50	\$32.50	\$33.50	\$44.50
No. 1 steel, Phila. area	34.00	34.50	37.50	45.50
No. 1 steel, Chicago	29.50	27.50	29.50	35.50
No. 1 bundles, Detroit	21.50	21.50	22.50	39.00
Low phos., Youngstown	34.00	32.50	33.00	46.50
No. 1 mach'y cast, Pittsburgh	48.50	48.50	49.50	52.50
No. 1 mach'y cast, Phila.	47.50	47.50	49.50	55.50
No. 1 mach'y cast, Chicago	42.50	41.50	44.50	45.50

Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	\$32.00	\$31.50	\$33.50	\$44.17
No. 2 bundles	23.17	22.83	24.83	37.17

Coke Connellsville: (per net ton at oven)				
Furnace coke, prompt	\$15.38	\$15.38	\$15.38	\$15.38
Foundry coke, prompt	\$17.50-\$19	\$17.50-\$19	\$17.50-\$19	\$17.50-\$19

Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	25.00	25.00	25.00	32.00
Copper, Lake, Conn.	25.00	25.00	25.00	32.00
Tin, Straits, N. Y.	94.00†	94.25	92.00	98.50
Zinc, East St. Louis	10.00	10.00	10.00	12.00
Lead, St. Louis	11.80	11.80	11.80	15.80
Aluminum, virgin ingot	26.10	26.10	26.10	27.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	33.00

† Tentative. ‡ Average. * Revised.

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Prices in Midwest Snap Back

Mills in the Chicago and Valley districts have come into the market finally.

Tonnages involved aren't large, but they may mark the beginning of better things.

■ The long-awaited upturn in the scrap market may have been touched off this week in the Midwest.

After weeks of dealer pressure for higher prices in the Chicago district, two mills came through with orders for limited tonnages of openhearth scrap at \$2 above the previous market. Factory bundles and railroad scrap moved at similarly strong prices.

And in the Youngstown area, another mill paid \$1 higher than going prices for primary steelmaking scrap.

The Chicago purchases raised The IRON AGE No. 1 heavy melting Composite Price 50¢ to \$32. It marks the first time in two months that the Composite Price has increased. Last week's \$31.50 Composite was the lowest since the summer of 1954.

Meanwhile, there was reason for cheer in the Detroit market where prices held after many weeks of skidding. Dealers there were heartened by news that two large mills had resumed production.

Optimism has spread as far east as Pittsburgh, where brokers expect an upturn in the near future, although the market at present shows few signs of life.

Pittsburgh—The market here is lifeless but not as weak as many had

anticipated. Brokers feel the generation of industrial scrap has dropped even lower than the rate of mill consumption. Local industrial lists were off only \$1 from last month. Some brokers say the better grades of scrap are due to improve.

Chicago—This market rebounded sharply, reflecting two weeks of increased upward pressure at the dealer level. Small buys by at least two area mills were backed by a mild push in broker buying prices and increased bids for factory scrap. Factory bundles moved at about \$37 and electric furnace and railroad grades moved at similarly strong prices.

Philadelphia—Opinions are split as to the price of steelmaking scrap in this district. It accounts for a \$2 spread in primary grade prices and in No. 2 heavy melting. There is some export activity going on. Otherwise, the market is quiet.

New York—Prices for No. 1 and No. 2 heavy melting dropped as much as \$3 on the basis of a buy last week by an eastern Pennsylvania mill. No. 1 heavy melting is now \$25-\$26. Other grades continue to move very slowly, and the price structure is flimsy.

Detroit—Local scrap prices seem to have reached a plateau, at least temporarily. Despite the continued shortage of orders, dealers are more bullish in their outlook. Return to production by the area's two largest mills is responsible for the changed attitude.

Cleveland—The market is look-

ing somewhat improved. A Valley mill bought limited tonnage of prime grades at \$1 above quoted prices. Production bundles brought \$35.50 and dealer bundles \$1 less. In Cleveland, a foundry purchase dropped the price of 2-ft foundry steel to \$30 plus \$1 springboard and brokers were having difficulty covering.

St. Louis—Prices are unchanged except for unstripped motor blocks which have been increased \$2 in an effort to bring them out. So far, the effort hasn't succeeded. One railroad withdrew its list of 3000 tons because of low prices. Another road withdrew 5000 tons because of mechanical reasons.

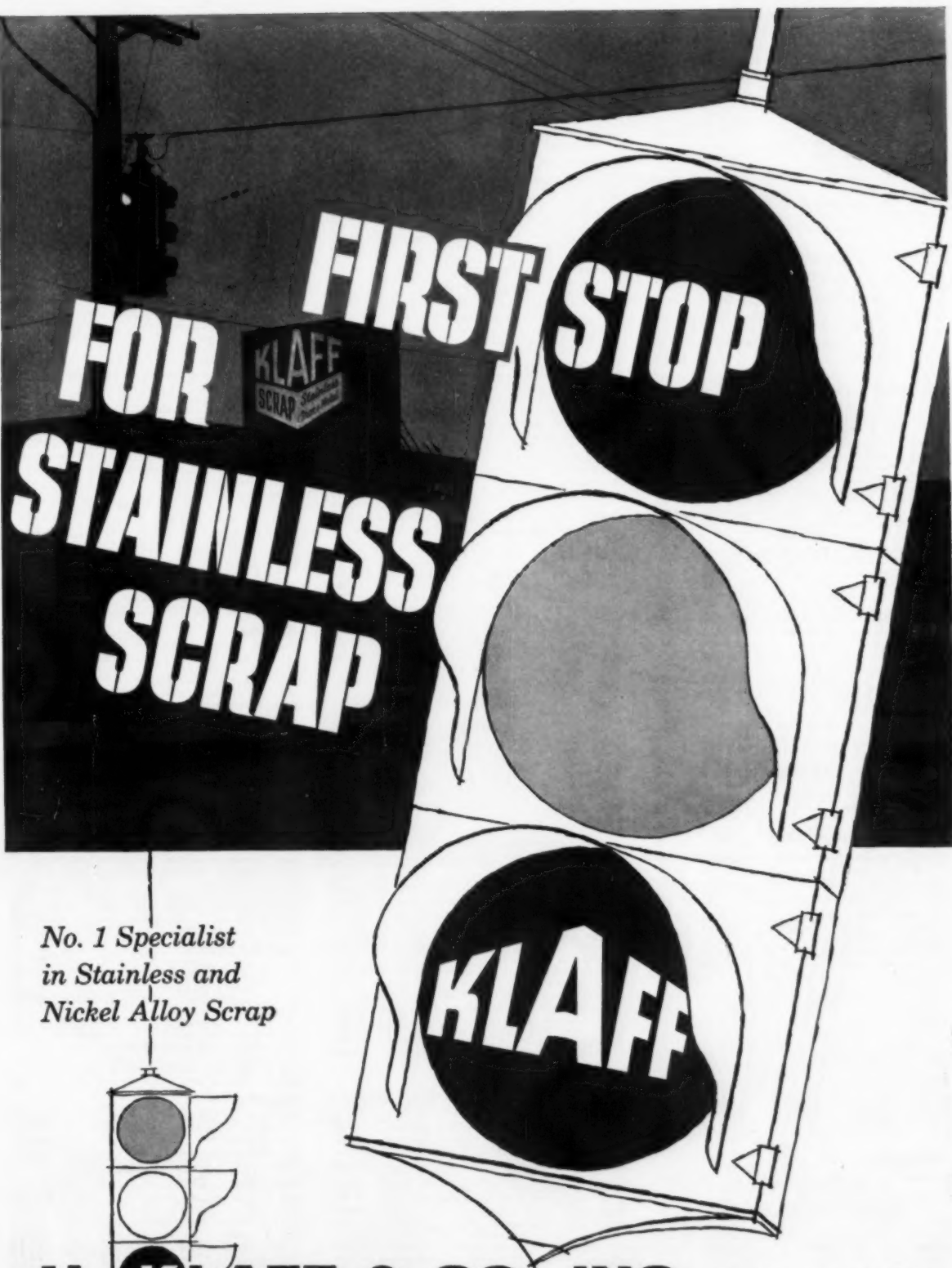
Birmingham—A railroad sold large tonnages of No. 1 heavy melting at about \$34 a gross ton on line. But none of this went to district mills. Most local mills are marking time until present orders are filled. Brokers expect nominal buying next week by some electric furnace mills at prices below their last purchases.

Cincinnati—Both area mills are buying at prices unchanged from a month ago. An additional expected drop never materialized, causing the market to rebound up to \$1.50 on prime grades from its month-end low. Present prices will probably bring out little more scrap from reluctant dealers. Foundry strike is settled, firming the cast market.

Buffalo—Prices are unchanged in a very sluggish market. Small token sales are being made but nothing big enough to set a price pattern. If there is any optimism among dealers, it is hard to find.

Boston—Steelmaking scrap, with the exception of No. 2 bundles, was down \$1 in the face of a dull market. Bundles held steady. Heavy breakable cast and unstripped motor blocks dropped \$2.

West Coast—Prices dropped \$2 a ton in Los Angeles and Seattle. Dealers say they won't be surprised to see another drop during May. No. 1 cupola cast demand is good in San Francisco.



*No. 1 Specialist
in Stainless and
Nickel Alloy Scrap*



H. KLAFF & CO., INC. *Baltimore 30, Md.*

PHONE LEXINGTON 9-6721

SCRAP PRICES (Effective May 6, 1958)

Pittsburgh

No. 1 hvy. melting	\$32.00 to \$33.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	32.00 to 33.00
No. 1 factory bundles	37.00 to 38.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	32.00 to 33.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and ms. turn.	12.00 to 13.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Low phos. punch'g's plate	37.00 to 38.00
Heavy turnings	28.00 to 29.00
No. 1 RR hvy. melting	36.00 to 37.00
Scrap rails, random lgth.	50.00 to 51.00
Rails 2 ft and under	54.00 to 55.00
RR steel wheels	44.00 to 45.00
RR spring steel	44.00 to 45.00
RR couplers and knuckles	44.00 to 45.00
No. 1 machinery cast.	48.00 to 49.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	37.00 to 38.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	100.00
430 bundles and solids	95.00 to 100.00
410 turnings	45.00

Chicago

No. 1 hvy. melting	\$29.00 to \$30.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	30.00 to 31.00
No. 1 factory bundles	36.00 to 37.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Low phos. forge crops	41.00 to 42.00
Low phos. punch'g's plate	35.00 to 36.00
Low phos. 3 ft and under	33.00 to 34.00
No. 1 RR hvy. melting	34.00 to 35.00
Scrap rails, random lgth.	43.00 to 44.00
Revolving rails	50.00 to 51.00
Rails 2 ft and under	46.00 to 47.00
Locomotive tires cut	42.00 to 43.00
Cut bolsters & side frames	39.00 to 40.00
Angles and splice bars	43.00 to 44.00
RR steel car axles	52.00 to 53.00
RR couplers and knuckles	39.00 to 40.00
No. 1 machinery cast.	42.00 to 43.00
Cupola cast.	35.00 to 36.00
Heavy breakable cast.	33.00 to 34.00
Cast iron brake shoes	34.00 to 35.00
Cast iron wheels	30.00 to 31.00
Malleable	46.00 to 47.00
Stove plate	33.00 to 34.00
Steel car wheels	36.00 to 37.00
Stainless	
18-8 bundles and solids	160.00 to 165.00
18-8 turnings	80.00 to 90.00
430 bundles and solids	90.00 to 95.00
430 turnings	45.00 to 50.00

Philadelphia Area

No. 1 hvy. melting	\$33.00 to \$35.00
No. 2 hvy. melting	29.00 to 31.00
No. 1 dealer bundles	33.00 to 35.00
No. 2 bundles	22.00 to 24.00
No. 1 busheling	33.00 to 35.00
Machine shop turn.	14.00 to 15.00
Mixed bor. short turn.	15.00 to 16.00
Cast iron borings	16.00 to 17.00
Shoveling turnings	17.00 to 18.00
Clean cast. chem. borings	31.00 to 32.00
Low phos. 5 ft and under	38.00 to 39.00
Low phos. 2 ft and under	39.00 to 40.00
Low phos. punch'g's	39.00 to 40.00
Elec. furnace bundles	34.00 to 35.00
Heavy turnings	28.00 to 29.00
RR steel wheels	42.50 to 43.50
RR spring steel	42.50 to 43.50
Rails 18 in. and under	56.00 to 58.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	40.00 to 41.00
Cast iron car wheels	43.00 to 44.00
Malleable	59.00 to 60.00
Unstripped motor blocks	30.00 to 31.00
No. 1 machinery cast.	47.00 to 48.00

Cincinnati

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$29.00 to \$30.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	19.50 to 20.50
Machine shop turn.	9.00 to 10.00
Mixed bor. and turn.	10.00 to 11.00
Shoveling turnings	11.00 to 12.00
Cast iron borings	10.00 to 11.00
Low phos. 18 in. and under	36.00 to 37.00
Rails, random length	42.00 to 43.00
Rails, 18 in. and under	52.00 to 53.00
No. 1 cupola cast.	38.00 to 39.00
Hvy. breakable cast.	32.00 to 33.00
Drop broken cast.	44.00 to 45.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Cleveland

No. 1 hvy. melting	\$29.50 to \$30.50
No. 2 hvy. melting	23.00 to 24.00
No. 1 dealer bundles	29.50 to 30.50
No. 1 factory bundles	32.50 to 33.50
No. 2 bundles	20.00 to 21.00
No. 1 busheling	29.50 to 30.50
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Cut structural & plates, 2 ft & under	34.00 to 35.00
Drop forge flashings	29.50 to 30.50
Low phos. punch'g's plate	30.50 to 31.50
Foundry steel, 2 ft & under	29.00 to 30.00
No. 1 RR hvy. melting	34.50 to 35.50
Rails 2 ft and under	53.00 to 54.00
Rails 18 in. and under	54.00 to 55.00
Railroad grate bars	14.00 to 15.00
Steel axle turnings	17.00 to 18.00
Railroad cast.	46.00 to 47.00
No. 1 machinery cast.	45.00 to 46.00
Stove plate	42.00 to 43.00
Malleable	58.00 to 59.00
Stainless	
18-8 bundles	160.00 to 165.00
18-8 turnings	85.00 to 90.00
430 bundles	80.00 to 90.00
430 turnings	35.00 to 40.00

Buffalo

No. 1 hvy. melting	\$26.00 to \$27.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 busheling	26.00 to 27.00
No. 1 dealer bundles	26.00 to 27.00
No. 2 bundles	20.00 to 21.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	12.00 to 13.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	13.00 to 14.00
Low phos. plate	32.00 to 33.00
Structural and plate, 2 ft and under	35.00 to 36.00
Scrap rails, random lgth.	39.00 to 40.00
Rails 2 ft and under	49.00 to 50.00
RR steel wheels	36.00 to 37.00
RR spring steel	32.00 to 33.00
RR couplers and knuckles	32.00 to 33.00
No. 1 machinery cast.	45.00 to 46.00
No. 1 cupola cast.	41.00 to 42.00

St. Louis

No. 1 hvy. melting	\$32.00 to \$33.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	23.00 to 24.00
Machine shop turn.	15.00 to 16.00
Cast iron borings	18.00 to 19.00
Shoveling turnings	18.00 to 19.00
No. 1 RR hvy. melting	35.00 to 36.00
Rails, random lengths	42.00 to 43.00
Rails, 18 in. and under	48.00 to 49.00
Angles and splice bars	43.00 to 44.00
Std. steel car axles	47.00 to 48.00
RR specialties	38.00 to 39.00
Cupola cast.	43.00 to 44.00
Heavy breakable cast.	32.00 to 33.00
Cast iron brake shoes	35.00 to 36.00
Stove plate	37.00 to 38.00
Cast iron car wheels	35.00 to 36.00
Revolving rails	47.00 to 48.00
Unstripped motor blocks	33.00 to 34.00

Birmingham

No. 1 hvy. melting	\$30.00 to \$31.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	30.00 to 31.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	30.00 to 31.00
Machine shop turn.	22.00 to 23.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	12.00 to 13.00
Electric furnace bundles	35.00 to 36.00
Elec. furnace, 3 ft & under	33.00 to 34.00
Bar crops and plate	37.00 to 38.00
Structural and plate, 2 ft.	36.00 to 37.00
No. 1 RR hvy. melting	31.00 to 32.00
Scrap rails, random lgth.	41.00 to 42.00
Rails, 18 in. and under	46.00 to 47.00
Angles & splice bars	37.00 to 38.00
Revolving rails	45.00 to 46.00
No. 1 cupola cast.	48.00 to 49.00
Stove plate	48.00 to 49.00
Charging box cast.	22.00 to 23.00
Cast iron car wheels	34.00 to 35.00
Unstripped motor blocks	37.00 to 38.00

Youngstown

No. 1 hvy. melting	\$32.50 to \$33.50
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	32.50 to 33.50
No. 2 bundles	23.00 to 24.00
Machine shop turn.	12.00 to 13.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. plate	33.50 to 34.50

New York

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$24.00 to \$25.00
No. 2 hvy. melting	21.00 to 22.00
No. 2 dealer bundles	15.50 to 16.50
Machine shop turn.	7.00 to 8.00
Mixed bor. and turn.	10.00 to 11.00
Shoveling turnings	10.00 to 11.00
Clean cast. chem. borings	22.00 to 23.00
No. 1 machinery cast.	32.00 to 33.00
Mixed yard cast.	31.00 to 32.00
Charging box cast.	29.00 to 30.00
Heavy breakable cast.	29.00 to 30.00
Unstripped motor blocks	22.00 to 23.00
Stainless	
18-8 prepared solids	135.00 to 140.00
18-8 turnings	45.00 to 50.00
430 prepared solids	65.00 to 70.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$24.00 to \$25.00
No. 2 hvy. melting	21.00 to 22.00
No. 1 dealer bundles	22.00 to 23.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	21.00 to 22.00
Drop forge flashings	20.00 to 21.00
Machine shop turn.	5.00 to 6.00
Mixed bor. and turn.	6.00 to 7.00
Shoveling turnings	7.00 to 8.00
Cast iron borings	7.00 to 8.00
Low phos. punch'g's plate	21.00 to 22.00
No. 1 cupola cast.	31.00 to 32.00
Heavy breakable cast.	21.00 to 22.00
Mixed cupola cast.	26.00 to 27.00
Automotive cast.	31.00 to 32.00
Stainless	
18-8 bundles and solids	155.00 to 160.00
18-8 turnings	55.00 to 60.00
430 bundles and solids	70.00 to 75.00
410 turnings	20.00 to 25.00

Boston

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$22.00 to \$23.00
No. 2 hvy. melting	18.00 to 19.00
No. 1 dealer bundles	22.00 to 23.00
No. 2 bundles	13.00 to 14.00
No. 1 busheling	22.00 to 23.00
Machine shop turn.	3.00 to 4.00
Mixed bor. and short turn.	4.00 to 5.00
Shoveling turnings	6.00 to 7.00
Clean cast. chem. borings	14.00 to 15.00
No. 1 machinery cast.	31.00 to 32.00
Mixed cupola cast.	26.00 to 27.00
Heavy breakable cast.	27.00 to 28.00
Stove plate	26.00 to 27.00
Unstripped motor blocks	22.00 to 23.00

San Francisco

No. 1 hvy. melting	\$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	28.00
No. 2 bundles	22.00
Machine shop turn.	15.00
Cast iron borings	15.00
No. 1 RR hvy. melting	32.00
No. 1 cupola cast.	44.00

Los Angeles

No. 1 hvy. melting	\$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	23.00
No. 2 bundles	20.00
Machine shop turn.	11.00
Shoveling turnings	\$11.00 to 13.00
Cast iron borings	11.00 to 13.00
Elec. furn. 1 ft and under (foundry)	43.00
No. 2 RR hvy. melting	34.00
No. 1 cupola cast.	41.00 to 42.00

Seattle

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	28.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	26.00
No. 1 dealer bundles	30.00
No. 2 bundles	23.00
Mixed steel scrap	25.00
Busheling	20.00
Bush., new fact., prep'd	28.00
Bush., new fact., unprep'd	28.00
Machine shop turn.	15.00
Short steel turn.	19.00
Mixed bor. and turn.	15.00
Rails, rerolling	39.00
Cast scrap	\$45.00 to 50.00

MOLY NEWS

CLIMAX MOLYBDENUM • DIVISION OF AMERICAN METAL CLIMAX, INC.



Climax Develops an Extremely Tough, Abrasion-resistant Chrome-Moly White Iron

New Alloy Proves Superior in Erosive Applications

A new martensitic white iron has proved exceptionally tough and resistant to abrasion. It's called Alloy 42. Its excellent combination of properties are related to its structure — which consists of hard chrome-moly carbides favorably distributed in a matrix of martensite plus retained austenite.

Tests indicate Alloy 42 is especially economical for parts subject to erosive wear: sand pumps, flotation impellers, sand classifier wear shoes, pug mill blades, brick mold liners and chute liners.

For example, heat-treated Alloy 42 impellers in a 5" sand pump handling coarsely ground taconite ore have already lasted over 1,000 hours. Previous impellers made of a 4.5% Ni, 1.5%

Cr type of martensitic iron lasted only 350 to 400 hours.

Because of its toughness, Alloy 42 can also be used where moderate impacts would cause low alloy types of white iron to break or spall. And it may prove more economical than the soft rubber parts or linings now used in various abrasive applications. Its resistance to tearing by tramp coarse materials and chemical attacks by oils and other organic compounds is an obvious advantage.

The recommended composition range is: Carbon 3.00-3.50%; Silicon 0.30-0.60; Manganese 0.60-0.90; Chromium 15.0-18.0; Molybdenum 2.75-3.25.

A Climax bulletin on Alloy 42 discusses melting and casting, molds and shrinkage, heat treatment, structure, physical properties, machinability, welding and cutting. For a free copy, circle #1 on the coupon.

Heat Treating Improves the Wear Resistance of Gray Iron

Heat treating can improve many of the properties of gray iron, particularly resistance to wear. Wear resistance in quenched-and-tempered gray iron is many times greater than that of pearlitic irons. With cams and similar parts, hot quenching provides better wear resistance than quenching and hardening to the same hardness. Surface hardening is frequently selected for gray iron because it locally improves wear resistance with minimum distortion.

Why Moly Iron Bulletin #6 contains valuable information on surface hardening, annealing and stress-relieving molybdenum-alloyed irons. This bulletin gives examples of improvements obtained by heat treating gears, cable drums, pump-ring castings, tappets, valve guides and machine tool ways.



Flame hardening the teeth on a sprocket improves wear resistance with minimum distortion.

For a free copy of *"Why Moly Iron Bulletin #6,"* circle #2 on the coupon.

Tempering Low-Alloy Creep-Resistant Steels

A recent British paper discusses the roles of chromium, molybdenum and vanadium in low-alloy steels with high creep strength. The relation between creep properties, microstructure changes and carbide composition is given special attention.

For a copy of *"The Tempering of Low-alloy Creep-resistant Steels Containing Chromium, Molybdenum and Vanadium"* by E. Smith and J. Nutting, circle #6.

Moly Helps High Alloys Fight Corrosive Attacks

Highly alloyed materials are playing a greater part in combating corrosion. A current paper on these alloys con-

siders the molybdenum-bearing alloys at length and also discusses cobalt-base alloys and silicon-bearing alloys.

For copies of this paper, *"High Alloys to Combat Corrosion"* by E. D. Weisert, circle #7.

Thermenol Shows Excellent Resistance to Heat, Corrosion

Thermenol, an iron-aluminum-molybdenum magnetic alloy, compares favorably with other high-temperature materials, and in some cases promises even better service. For unlike many alloys, it doesn't lose tensile strength rapidly up to 1200 F. It also has excellent resistance to oxidizing and sulfur-bearing atmospheres at high temperatures.

For a copy of *"Iron-aluminum Magnetic Alloy Has Excellent Heat Resistance,"* circle #8.

Moly in Nickel-base Casting Alloys Improves High Temperature Service

Molybdenum is helping at least two nickel-base alloys to work more effectively in high temperature applications. One of the alloys, with 5% Mo, combines good castability with very good creep strength at temperatures up to 1800 F (much better than that of moly-free alloys). The second, with 10% Mo, shows high resistance to thermal shock.

For free copies of *"Some Properties of Nickel-base Casting Alloys for High-temperature Service"* by D. R. Wood and J. F. Gregg, circle #3.

Cast Steels Studied at Low Temperatures

The British Steel Castings Research Association has completed new studies on the effect of melting practice, composition and treatment of steel castings. Five of the seven alloy steels investigated contained molybdenum. The benefits of using molybdenum in low alloy steel castings for low temperature service are clearly shown in comparisons of 1.5% Mn and 1.5% Mn-Mo.

For reprints of *"The Low-temperature Impact Properties of Cast Steel"* by W. J. Jackson and G. M. Mickie, circle #4.

New Data Available on Low Carbon Bainitic Steels

Studies have been made on new steels based on boron-0.5% Mo. Tensile strengths up to 180,000 psi can now be obtained within the bainitic range with a wide range of cooling rates. Thus these low-carbon bainitic steels offer a good combination of mechanical properties as-rolled or as-air-cooled. These properties can be obtained in large sections because hardenability is high. Good welding properties and tempering characteristics make the steels especially suitable as high-strength weldable steels, forgings, die blocks, etc.

For copies of *"Low-carbon Bainitic Steels"* by K. J. Irvine and F. B. Pickering, circle #5.

Climax Molybdenum, Dept. 2
Division of American Metal Climax, Inc.
500 Fifth Avenue, New York 36, N. Y.

I'd like more information on:

1 2 3 4 5 6 7 8

Name

Company

Street

City State

Industry Opposes Subsidy Plan

Domestic miners say a subsidy is not the help they need.

But the State Dept. opposes higher tariffs.

Most likely: Sharp skirmishes followed by a compromise.

■ The question is still unanswered. "How do we give domestic metal industries the support they say they need without alienating our allies abroad whose economies depend on exports to our markets?"

Last week Interior Secretary Fred A. Seaton tried again. He suggested subsidies for copper, lead, zinc, and tungsten.

Seaton Plan—Mr. Seaton wants the government to pay domestic producers the difference between what they can sell their metal for in the domestic market, and a "stabilization price." His plan limits the tonnage of metal supported.

Stabilization		
Commodity	Price Per Lb.	Annual Limit (tons)
Copper	27½¢	1,000,000
Lead	14¾¢	350,000
Zinc	12¾¢	550,000
Tungsten	\$36*	375,000*
Fluorspar	\$48†	180,000

* Per short ton unit.

† Per short ton.

Mr. Seaton suggests the plan be authorized for five years. He estimates the first year cost at about \$161 million.

Before his proposals could even be put in the form of a bill for Congressional consideration, domestic metals men, almost as one, said "No thanks."

Opinions Against—Some of the comments:

"When the government gives you money it takes some control. We don't want this."

"Subsidies are crutches. Some day you'll have to walk without them, and you're in trouble if you get too used to them."

"The stabilization price suggested is more a ceiling than a floor. (copper) We need a higher price if new domestic properties are to be developed."

"Historically, subsidies never seem to help the people they are supposed to help."

"Subsidies once started inevitably extend down through the various levels of an industry and other related industries with a distinctive effect on the entire economy."—T. E. Veltfort, Copper & Brass Research Assn.

Last year, the Secretary of Interior suggested sliding scale tariffs. The State Dept. quietly helped put on enough pressure to scuttle the proposals. The belief was higher tariffs would hurt our Free World prestige.

Change in Thinking—Washington observers say the overwhelming negative reception of the new Administration plan by industry may change the line of thinking on the problem. Administration agencies, Congressional committees, and industry associations will quit probing for the ultimate—the answer that would please everyone.

Most likely, they predict (1) meetings, conferences and hearings at which all parties will take firmer stands, and (2) sharp skirmishes behind the scenes, followed by a

compromise. There'll probably be some slight tariff hikes, and subsidies in the form of some sort of stockpiling program.

Keep an Eye On—To tell which way the wind is blowing, close observers advise: (1) Watch the alliances that develop in Congress as the Seaton plan is discussed in committees and cloakrooms, (2) watch what the President does with the Tariff Commission recommendations on lead-zinc, (3) watch for signs of renewed barter activity, and (4) watch the strength of the opposition to the President's request for a five-year extension of reciprocal trade agreements with power to cut tariffs.

Tin prices for the week: April 30—93.75; May 1—94.25; May 2—94.25; May 5—94.00; May 6—94.00.*

* Estimate.

Primary Prices

(cents per lb)	Current price	last price	date of change
Aluminum pig	24.00	26.00	4/1/58
Aluminum ingot	26.10	26.10	4/1/58
Copper (E)	25.00	27.00	1/13/58
Copper (CS)	23.75	23.50	4/23/58
Copper (L)	25.00	27.00	1/13/58
Lead, St. L.	11.00	12.00	4/2/58
Lead, N. Y.	12.00	13.00	4/2/58
Magnesium ingot	36.00	34.00	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	84.50	12/8/58
Titanium sponge	185-200	200-250	4/1/58
Zinc, E. St. L.	10.00	10.00	7/1/57
Zinc, N. Y.	10.50	11.00	7/1/57

ALUMINUM: 99% ingot frt allwd. **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic, (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig Velasco, Tex. **NICKEL:** Port Colbourne, Canada. **ZINC:** prime western. **TIN:** see above; other primary prices, pg. 148.

Monthly Average Metal Prices

(Cents per lb except as noted)

Average prices of the major nonferrous metals in April based on quotations appearing in THE IRON AGE, were as follows:

Electrolytic copper, del'd	
Conn. Valley	25.00
Copper, Lake	25.00
Straits Tin, New York	92.952
Zinc, E. St. Louis	10.00
Lead, St. Louis	11.85
Aluminum ingot	26.10

Note: Quotations are going prices

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NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate
("F" temper except 6061-0)

Alloy	.002	.061	.136- .249	.250- 3
1100, 3003.....	44.6	42.3	41.1	41.7
6052.....	52.0	46.9	45.2	44.4
6061-0.....	49.4	45.0	43.2	43.1

Extruded Solid Shapes

Factor	6063 T-5	6063 T-6
6-8.....	45.0-46.8	58.4-62.1
12-14.....	45.7-47.2	59.3-63.8
24-26.....	49.6-49.5	70.1-74.8
36-38.....	58.0-58.6	94.3-97.8

Screw Machine Stock—2011-T-3

Size*	3/4	7/8-1	1-1 1/4
Price.....	61.0	60.5	59.0

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage.....	\$1.411	\$1.584	\$2.353	\$3.523
.024 gage.....	1.762	2.249	2.937	3.524

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type↓	Gage→	.250	.250-	.188	.061	.032
AZ31B Stand, Grade.....		67.9	69.0	77.9	108.1	
AZ31B Spec.....		93.3	95.7	108.7	171.3	
Tread Plate.....		70.6	71.7			
Tooling Plate.....		73.0				

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C).....	69.6	70.7	75.6	89.2
Spec. Grade... (AZ31B).....	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting)..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

"A" Nickel Monel

	Nickel	Monel	Inconel
Sheet, CR	126	106	123
Strip, CR	124	108	123
Rod, bar, HR ..	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube. 157		129	200
Shot, blocks ..		87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper.....	48.13	.....	45.36	45.32
Brass, 70/30.....	42.69	43.23	42.63	45.60
Brass, Low.....	44.90	45.44	44.84	47.71
Brass, R L.....	45.67	46.21	45.61	48.48
Brass, Naval.....	47.07	.....	41.38	50.48
Muntz Metal.....	45.19	.....	41.00	.....
Comm. Bs.....	46.98	47.53	46.92	49.54
Mang. Bs.....	50.81	.....	44.91	.....
Phos. Bs. 5%.....	67.17	.....	67.67	.....

Free Cutting Brass Rod 31.03

TITANIUM

(Freight included in 5000 lbs)

Sheet and strip, commercially pure, \$8.50-\$10.10; alloy, \$15.95; Plate, HR, commercially pure, \$6.00-\$6.75; alloy, \$8.75-\$9.50. Wire, rolled and/or drawn, commercially pure, \$6.50-\$7.00; alloy, \$10.00-\$11.50; Bar, HR or forged, commercially pure, \$5.25-\$5.50; alloy, \$5.25-\$6.35; billets, HR, commercially pure, \$4.10-\$4.35; alloy, \$4.10-\$4.20.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex. 29.50
Beryllium aluminum 5% Be, Dollar
per lb contained Be.....\$74.75
Beryllium copper, per lb contain'd Be.....\$43.00
Beryllium 97% lump or beads,
f.o.b. Cleveland, Reading\$71.50
Blenneth, ton lots\$ 2.25
Cadmium, del'd small lots\$ 4.55
Calcium, 99.9% metallic basis.....\$ 1.31
Cobalt, 97-99% (per lb).....\$2.00 to \$2.07
Germanium, per gm, f.o.b. Miami,
Okla., refined\$39.50 to 50.00
Gold, U. S. Treas., per troy oz.....\$35.00
Indium, 99.9%, dollars per troy oz.....\$ 2.25
Iridium, dollars per troy oz.....\$80 to \$90
Lithium, 98%\$11.00 to \$14.00
Magnesium, sticks, 100 to 500 lb..... 59.00
Mercury, dollars per 76-lb flask,
f.o.b. New York\$228 to \$231
Nickel oxide sinter at Copper
Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz.....\$19 to \$21
Platinum, dollars per troy oz.....\$67 to \$72
Rhodium\$120.00 to \$125.00
Silver ingots (\$ per troy oz.).....88.625
Thorium, per kg.\$43.00
Vanadium\$ 3.45
Zirconium sponge\$ 5.06

Remelted Metals

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 Ingot
No. 115 25.25
No. 120 24.25
No. 123 23.50
80-10-10 Ingot
No. 305 29.25
No. 315 27.25
88-10-2 Ingot
No. 210 36.25
No. 215 32.00
No. 245 28.75
Yellow Ingot
No. 405 21.25
Manganese bronze
No. 421 23.00

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 24.00-24.25
0.60 copper max. 23.75-24.00
Piston alloys (No. 122 type)..... 23.25-24.25
No. 12 alum. (No. 2 grade)..... 21.00-21.75
108 alloy 21.50-22.25
195 alloy 24.00-25.50
13 alloy (0.60 copper max.)..... 23.75-24.00
AXS-679 (1 pct zinc) 21.25-22.25

Steel deoxidizing aluminum notch bar
granulated or shot

Grade 1—95-97 1/2% 22.00-23.50
Grade 2—92-95% 21.00-21.75
Grade 3—90-92% 20.00-20.75
Grade 4—85-90% 17.50-18.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	31	20 1/4
Yellow brass	16 1/4	14 1/4
Red brass	18 1/4	17 1/4
Comm. bronze	19 1/4	18 1/4
Mang. bronze	14 1/4	14 1/4
Yellow brass rod ends	15 1/4	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 19 1/4
No. 2 copper wire 18 1/4
Light copper 16
Refinery brass 17 1/4
Copper bearing material 17
Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 19 1/4
No. 2 copper wire 18 1/4
Light copper 16
No. 1 composition 18 1/4
No. 1 comp. turnings 18
Hvy. yellow brass solids 13
Brass pipe 15
Radiators 14 1/4

Aluminum
Mixed old cast 12 —13
Mixed new clips 14 1/2 —15 1/2
Mixed turnings, dry 12 1/2 —13 1/2

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass
No. 1 copper wire 17 1/2 —18
No. 2 copper wire 15 1/2 —16
Light copper 13 1/2 —14
Auto radiators (unswaged) 11 —11 1/4
No. 1 composition 13 1/2 —14
No. 1 composition turnings 12 —12 1/2
Cocks and faucets 10 —10 1/2
Clean heavy yellow brass 12 —12 1/2
Brass pipe 13 —13 1/2
New soft brass clippings 10 1/2 —11
No. 1 brass rod turnings 10 1/2 —11

Aluminum

Alum. pistons and struts 5 —5 1/4
Aluminum crankcases 9 1/2 —10
1100 (2S) aluminum clippings 12 1/2 —13
Old sheet and utensils 9 1/2 —10
Borings and turnings 6 —6 1/4
Industrial castings 9 1/2 —10
2024 (24S) clippings 11 —11 1/4

Zinc

New zinc clippings 4 —4 1/4
Old zinc 3 —3 1/4
Zinc routings 1 1/4 —2
Old die cast scrap 1 1/2 —1 3/4

Nickel and Monel

Pure nickel clippings 42-45
Clean nickel turnings 37-40
Nickel anodes 42-45
Nickel rod ends 42-45
New Monel clippings 28-29
Clean Monel turnings 20-23
Old sheet Monel 25-26
Nickel silver clippings, mixed 18
Nickel silver turnings, mixed 15

Lead

Soft scrap lead 7 1/2 —8
Battery plates (dry) 2 1/4 —3
Batteries, acid free 1 1/4 —2

Miscellaneous

Block tin 75 —76
No. 1 pewter 59 —60
Auto babbitt 39 —40
Mixed common babbitt 11 —11 1/4
Solder joints 14 1/2 —15
Siphon tops 42
Small foundry type 12 —12 1/4
Monotype 12 —12 1/4
Lino. and stereotype 11 —11 1/4
Electrotype 10 —10 1/4
Hand picked type shells 7 —7 1/4
Lino. and Stereo. dross 3 —3 1/4
Electro. dross 2 1/2 —2 3/4

IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL
PRICES

	BILLETS, BLOOMS, SLABS			PIL- ING	SHAPES STRUCTURALS			STRIP					
	Carbon Re-rolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled
EAST	Bethlehem, Pa.		\$114.00 B3		5.325 B3	7.00 B3	5.325 B3						
	Buffalo, N. Y.	\$77.50 R3, B3	\$96.00 R3, B3	\$114.00 R3, B3	6.225 B3	5.325 B3	7.00 B3	5.325 B3	4.925 R3, B3	7.15 S10	7.325 B3		
	Phila., Pa.								7.70 P15				
	Harrison, N. J.												15.05 C11
	Conshehocken, Pa.		\$101.00 A2	\$121.00 A2				4.975 A2	7.20 A2	7.325 A2			
	New Bedford, Mass.								7.60 R6				
	Johnstown, Pa.	\$77.50 B3	\$96.00 B3	\$114.00 B3		5.325 B3	7.00 B3						
	Boston, Mass.								7.70 T8				15.40 T8
	New Haven, Conn.								7.60 D1				
	Baltimore, Md.								7.15 T8				
	Phoenixville, Pa.				5.325 P2		5.325 P2						
	Sparrows Pt., Md.							4.925 B3		7.325 B3			
MIDDLE WEST	New Britain, Bridgeport, Wallingford, Conn.		\$114.00 N8						7.60 W1, S7				
	Pawtucket, R. I. Worcester, Mass.								7.70 N7 7.70 A5				15.40 N7 15.20 T8
	Alton, Ill.							5.125 L1					
	Ashland, Ky.							4.925 A7					
	Canton-Massillon, Dover, Ohio		\$98.50 R3	\$114.00 R3, T5					7.15 G4		10.45 G4		14.85 C11
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	\$77.50 U1, R3	\$96.00 U1, R3, W8	\$114.00 U1, R3, W8	6.225 U1	5.275 U1, W8, P13	7.75 U1, Y1 W8	5.275 U1	4.925 W8, N4, A1	7.25 A1, T8 M8		8.10 W8, S9, I3	15.05 A1, S9, G4
	Cleveland, Ohio								7.15 A5, J3		10.45 A5	8.10 J3	
	Detroit, Mich.			\$114.00 R5				5.025 G3, M2	7.25 M2, D1, D2, G3, P11	7.425 G3	10.60 D2 10.55 G3	8.10 G3	
	Anderson, Ind.								7.15 G4				
	Duluth, Minn.												
	Gary, Ind. Harbor, Indiana	\$77.50 U1	\$96.00 U1	\$114.00 U1, Y1		5.275 U1, I3	7.75 U1, I3	5.275 I3	4.925 U1, I3, Y1	7.15 Y1	7.325 U1, I3, Y1	10.60 Y1	8.10 U1, Y1
	Sterling, Ill.	\$77.50 N4				5.275 N4		5.025 N4					
	Indianapolis, Ind.								7.30 J3				15.20 J3
	Newport, Ky.											8.10 A9	
	Middletown, Ohio												
	Niles, Warren, Ohio Sharon, Pa.		\$96.00 S1, C10	\$114.00 C10, S1				4.925 R3, S1	7.15 R3, T4 S1	7.325 R3, S1	10.50 S1 10.45 R3	8.10 S1	15.05 S1
	Owensboro, Ky.	\$77.50 G5	\$96.00 G5	\$114.00 G5									
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	\$77.50 U1, P6	\$96.00 U1, C11, P6	\$114.00 U1, C11, B7	6.225 U1	5.275 U1, J3	7.75 U1, J3	5.275 U1	4.925 P6	7.15 J3, B4		8.10 S9	15.05 S9
	Weirton, Wheeling, Follansbee, W. Va.				6.225 W3	5.275 W3		5.275 W3	4.925 W3	7.15 W3, F3	7.325 W3	10.50 W3	
	Youngstown, Ohio	\$77.50 R3	\$96.00 Y1, C10	\$114.00 Y1			7.75 Y1			7.15 Y1, J3	7.325 U1, Y1	10.65 Y1	8.10 U1, Y1 10.65 Y1
WEST	Fontana, Cal.	\$88.00 K1	\$105.50 K1	\$135.00 K1		6.075 K1	8.55 K1	6.225 K1	5.675 K1	9.00 K1			
	Gonave, Utah		\$96.00 C7			5.275 C7	7.75 C7						
	Kansas City, Mo.					5.375 S2	7.85 S2					8.35 S2	
	Los Angeles, Torrance, Cal.		\$105.50 B2	\$134.00 B2		5.975 C7, B2	8.45 B2		5.675 C7, B2	9.05 J3 9.20 C1		9.30 B2	17.25 J3
	Minnequa, Colo.					5.575 C6			6.025 C6	9.10 K1			
	Portland, Ore.					6.025 O2							
	San Francisco, Niles, Pittsburg, Cal.		\$105.50 B2			5.925 B2	8.40 B2		5.675 C7, B2				
	Seattle, Wash.		\$109.50 B2			6.025 B2	8.50 B2		5.925 B2				
SOUTH	Atlanta, Ga.					5.475 A8			4.925 A8				
	Fairfield, Ala. City, Birmingham, Ala.	\$77.50 T2	\$96.00 T2			5.275 T2, R1, C16	7.75 T2		4.925 T2, R3, C16	7.325 T2			
	Houston, Lone Star, Texas		\$101.00 S2	\$119.00 S2		5.375 S2	7.85 S2					8.35 S2	

(Effective May 5, 1958)

IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL
PRICES

STEEL PRICES		SHEETS							WIRE ROD	TINPLATE†		BLACK PLATE	
		Hot-rolled 18 ga. & heavy.	Cold- rolled	Galvanized	Enamel- ing	Long Tone	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.	
EAST	Bethlehem, Pa.												
	Buffalo, N. Y.	4.925 B3	6.05 B3				7.275 B3	8.975 B3	6.15 W6	† Special coated mfg. turne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct \$2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add \$1.00. Differ- ential 1.00 lb. 0.25 lb. add 65¢.			
	Claymont, Del.												
	Coatesville, Pa.												
	Conschocken, Pa.	4.975 A2	6.10 A2				7.325 A2						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johntown, Pa.								6.15 B3				
	Fairless, Pa.	4.975 U1	6.10 U1				7.325 U1	9.025 U1		\$10.15 U1	\$8.85 U1		
	New Haven, Conn.												
Phoenixville, Pa.													
Sparrows Pt., Md.	4.925 B3	6.05 B3	6.60 B3			7.275 B3	8.975 B3	9.725 B3	6.25 B3	\$10.15 B3	\$8.85 B3		
Worcester, Mass.									6.45 A5				
Tronton, N. J.													
MIDDLE WEST	Alton, Ill.								6.35 L1				
	Ashland, Ky.	4.925 A7		6.60 A7	6.625 A7								
	Canton-Massillon, Dover, Ohio			6.60 R3, R1									
	Chicago, Joliet, Ill.	4.925 W8, A1					7.275 U1		6.15 A5, R3, W8, N4, K2				
	Sterling, Ill.								6.25 N4, K2				
	Cleveland, Ohio	4.925 R3, J3	6.05 R3, J3		6.625 R3		7.275 R3, J3	8.975 R3, J3	6.15 A5				
	Detroit, Mich.	5.025 G3, M2	6.15 G3 6.05 M2				7.375 G3	9.075 G3					
	Newport, Ky.	4.925 A1	6.05 A1										
	Gary, Ind. Harbor, Indiana	4.925 U1, I3, Y1	6.05 U1, I3, Y1	6.60 U1, I3	6.625 U1, I3, Y1	7.00 U1	7.275 U1, Y1, I3	8.975 U1, Y1	6.15 Y1	\$10.05 U1, Y1	\$8.75 I3, U1, Y1	7.50 U1, Y1	
	Granite City, Ill.	5.125 G2	6.25 G2	6.80 G2	6.825 G2						\$8.85 G2	7.60 G2	
	Kokomo, Ind.			6.70 C9					6.25 C9				
	Mansfield, Ohio		6.05 E2			7.00 E2							
	Middletown, Ohio		6.05 A7	6.60 A7	6.625 A7	7.00 A7							
	Niles, Warren, Ohio Sharon, Pa.	4.925 R3, N3, S1	6.05 R3	6.60 R3	6.625 N3, S1	7.00 N3, S1, R3	7.275 R3	8.975 S1, R3			\$8.75 R3		
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	4.925 U1, J3, P6	6.05 U1, J3, P6	6.60 U1, J3	6.625 U1		7.275 U1, J3	8.975 U1, J3	9.725 U1	6.15 A5, J3, P6	\$10.05 U1, J3	\$8.75 U1, J3	7.50 U1, J3
	Portsmouth, Ohio	4.925 P7	6.05 P7						6.15 P7				
	Weirton, Wheeling, Follansbee, W. Va.	4.925 W3, W5	6.05 W3, F3, W5	6.60 W3, W5		7.00 W3, W5	7.275 W3	8.975 W3		\$10.05 W3, W5	\$8.75 W3, W5	7.50 W3	
Youngstown, Ohio	4.925 U1, Y1	6.05 Y1		6.625 Y1		7.275 Y1	8.975 Y1	6.15 Y1					
WEST	Fontana Cal.	5.675 K1	7.30 K1				6.825 K1	10.275 K1		\$10.00 K1	\$9.50 K1		
	Geneva, Utah	5.025 C7											
	Kansas City, Mo.								6.40 S2				
	Los Angeles, Torrance, Cal.								6.95 B2				
	Minnequa, Colo.								6.40 C6				
	San Francisco, Niles, Pittsburgh, Cal.	5.625 C7	7.00 C7	7.35 C7					6.95 C7	\$10.00 C7	\$9.50 C7		
	Seattle, Wash.												
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	4.925 T2, R3	6.05 T2, R3	6.60 T2, R3	6.625 T2				6.15 T2, R3	\$10.15 T2	\$8.85 T2		
	Houston, Tex.								6.40 S2				

STEEL
PRICES

	BARS						PLATES				WIRE
	Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Flat Plate	Alloy	Hi Str. Low Alloy	Mirr. Bright
EAST	Bethlehem, Pa.			6.475 B3	8.775 B3	7.925 B3					
	Buffalo, N. Y.	5.425 R3,B3	5.425 R3,B3	7.35 B5	6.475 B3,R3	8.775 B3,B5	7.925 B3	5.10 B3		7.20 B3	7.65 W6
	Claymont, Del.							5.10 C4		7.20 C4	7.625 C4
	Coatesville, Pa.							5.10 L4		7.20 L4	7.625 L4
	Conshohocken, Pa.							5.20 A2	6.175 A2	7.20 A2	7.625 A2
	Harrisburg, Pa.							5.10 P2	6.275 P2		
	Milton, Pa.	5.575 M7	5.575 M7								
	Hartford, Conn.			7.80 R3		9.075 R3	7.925 B3				
	Johnstown, Pa.	5.425 B3	5.425 B3		6.475 B3			5.10 B3		7.20 B3	7.625 B3
	Fairless, Pa.	5.575 U1	5.575 U1		6.625 U1						
	Newark, N. J.			7.75 W10		8.95 W10					
	Camden, N. J.			7.75 P10		8.95 P10					
	Bridgeport, Conn.			7.85 W10	8.55 N8	8.925 N8					
	Putnam, Conn.			7.80 J3							
MIDDLE WEST	Williamstown, Conn.										
	Sparrows Pt., Md.		5.425 B3					5.10 B3		7.20 B3	7.625 B3
	Palmer, Worcester, Mass.			7.85 B5,C14		9.075 A5,B5					7.95 A5, W6
	Readville, Mass.										
	Mansfield, Mass.										
	Spring City, Pa.			7.75 K4		8.95 K4					
	Alton, Ill.	5.625 L1									7.85 L1
	Ashland, Newport, Ky.							5.10 A7,A1		7.20 A1	
	Canton, Massillon, Ohio	5.90 R3		7.30 R3,R2	6.475 R3,T5	8.775 R3,R2,T5					
	Chicago, Joliet, Waukegan, Ill.	5.425 U1,R3, W8,N4,P13	5.425 U1,R3, N4,P13	7.30 A5, W10,W8 B5,L2,N9	6.475 U1,R3, W8	8.775 A5, W10,W8 L2,N8,B5	7.925 U1,W8	5.10 U1,A1, W8,I3	6.175 U1	7.20 U1,W8	7.625 U1,W8
	Harvey, Ill.										7.65 A5,R3, W8,N4, K2,W7
	Cleveland, Ohio	5.425 R3	5.425 R3	7.30 A5,C13 C18		8.775 A5, C13, C18	7.925 R3	5.20 R3,J3	6.175 J3		7.625 R3, J3
	Elyria, Ohio										7.65 A5, C13
	Detroit, Mich.	5.525 G3	5.775 G3	7.55 P3 7.50 P8,B5	6.475 R5 6.575 G3	8.775 R5 8.975 B5,P3, P8	8.025 G3	5.20 G3		7.35 G3	
WEST	Duluth, Minn.										7.65 A5
	Gary, Ind. Harbor, Crawfordville, Hammond, Ind.	5.425 U1,I3, Y1	5.425 U1,I3, Y1	7.30 R3,J3	6.475 U1,I3, Y1	8.775 R3,M4 Y1	7.925 U1, Y1	5.10 U1,I3, Y1	6.175 J3,I3	7.20 U1,Y1	7.625 U1, Y1,I3
	Granite City, Ill.							5.30 G2			
	Kokomo, Ind.		5.525 C9								7.75 C9
	Sterling, Ill.	5.525 N4	5.525 N4					5.10 N4			7.75 K2
	Niles, Warren, Ohio			7.30 C10	6.475 C10,S1	8.775 C10	7.925 S1	5.10 R3,S1		7.20 S1	7.625 R3, S1
	Sharon, Pa.										
	Owensboro, Ky.	5.425 G5			6.475 G5						
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.425 U1,J3	5.425 U1,J3	7.30 A5,B4, R3,J3,C11, W10,S9,C6	6.475 U1,J3, C11,B7	8.775 A5, W10,R5,S9, C11,C8	7.925 U1,J3	5.10 U1,J3	6.175 U1	7.20 U1,J3, B7	7.625 U1,J3, B7
	Pennsauken, Ohio										7.65 P7
	Weirton, Wheeling, Follansbee, W. Va.							5.10 W5			
	Youngstown, Ohio	5.425 U1,R3, Y1	5.425 U1,R3, Y1	7.30 A5,Y1, F2	6.475 U1,Y1	8.775 Y1,F2	7.925 U1,Y1	5.10 U1,R3, Y1		7.20 Y1	7.625 U1, R3,Y1
											7.65 Y1
SOUTH	Emoryville, Cal.	6.175 J5	6.175 J5								
	Fontana, Cal.	6.125 K1	6.125 K1		7.325 K1		8.625 K1	5.90 K1		8.00 K1	8.425 K1
	Genoa, Utah							5.10 C7			7.625 C7
	Kansas City, Mo.	5.675 S2	5.675 S2		6.725 S2		8.175 S2				7.90 S2
	Los Angeles, Torrance, Cal.	6.125 C7,B2	6.125 C7,B2	8.75 R3,P14	7.325 B2	10.75 P14	6.625 B2				8.60 B2
	Minneapolis, Colo.	5.875 C6	5.875 C6					5.95 C6			7.90 C6
	Portland, Ore.	6.175 O2	6.175 O2								
	San Francisco, Niles, Pittsburg, Cal.	6.125 C7 6.175 B2	6.125 C7 6.175 B2				8.675 B2				8.60 C7,C6
	Seattle, Wash.	6.175 B2,N6	6.175 B2				8.675 B2	6.00 B2		8.10 B2	8.525 B2
SOUTH	Atlanta, Ga.	5.625 A8	5.425 A8								7.65 A8
	Fairfield, Ala. City, Birmingham, Ala.	5.425 T2,R3, C16	5.425 T2,R3, C16	7.90 C16		7.925 T2		5.10 T2,R3			7.625 T2
											7.65 T2,R3
SOUTH	Houston, Ft. Worth, Lone Star, Tex.	5.675 S2	5.675 S2		6.725 S2		8.175 S2	5.20 S2 5.20 L3		7.30 S2	7.725 S2
											7.90 S2

STEEL PRICES

Key to Steel Producers

With Principal Offices

- A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.
C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shifting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shifting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Blast Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.
E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.
F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

- G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.
H1 Hanna Furnace Corp., Detroit
I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland
J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joalyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.
K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.
L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.
M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.
O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland
P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit

- P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.
R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebbing Sons Co., John A., Trenton, N. J.
R5 J. & L. Steel Co., Stainless Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.
S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston
U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham
W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.
Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (per) l.a.b. mills. Base price about \$200 per net ton.

	BUTTWELD												SEAMLESS											
	1/2 in.		3/4 in.		1 in.		1 1/4 in.		1 1/2 in.		2 in.		2 1/2 in.		3 in.		3 1/2 in.		4 in.		4 1/2 in.		5 in.	
	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.
STANDARD T. & C.																								
Sparrows Pt. B3...	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50										
Youngstown R3...	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50										
Fontana K1...	+8.25	+23.5	+5.25	+19.5	+1.75	+15.00	0.75	+14.25	1.25	+13.25	1.75	+12.75	3.25	+13.00										
Pittsburgh J3...	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50		
Alton, Ill. L1...	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50										
Sharon M3...	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50										
Fairless N2...	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50										
Pittsburgh N1...	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50		
Wheeling W5...	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50										
Wheatland W4...	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50										
Youngstown Y1...	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50		
Indiana Harbor Y1...	4.25	+11.0	7.25	+7.0	10.75	+2.50	13.25	+1.75	13.25	+0.75	14.25	+0.25	15.75	+1.00										
Lorain N2...	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50		
EXTRA STRONG PLAIN ENDS																								
Sparrows Pt. B3...	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	3.25	15.75	2.25	16.25	2.75	16.75	1.50										
Youngstown R3...	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50										
Fairless N2...	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	3.25	15.75	2.25	16.25	2.75	16.75	1.50										
Fontana K1...	+3.25	0.25	list	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50		
Pittsburgh J3...	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50										
Alton, Ill. L1...	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	3.25	15.75	2.25	16.25	2.75	16.75	1.50										
Sharon M3...	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50										
Pittsburgh N1...	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50		
Wheeling W5...	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50										
Wheatland W4...	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50										
Youngstown Y1...	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50		
Indiana Harbor Y1...	8.75	+5.0	12.75	+1.0	15.75	3.50	16.25	3.25	16.75	3.25	17.25	3.75	17.75	2.50										
Lorain N2...	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50		

Threads only, butt-weld and seamless 2 1/2 pt. higher discount. Plain ends, butt-weld and seamless, 3-in. and under, 5 1/2 pt. higher discount. Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/4, 1 1/2 and 2-in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2 1/2 and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

(Effective May 5, 1958)

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)
Pct. Discounts

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
1/2" and smaller x 6" and shorter	49	54	56	57
5/8" thru 1" x longer than 6"	35	40	43	45
Roll thread carriage bolts 1/2" & smaller x 6" and shorter	49	54	56	57
Lag, all diam. x 6" & shorter	49	54	56	57
Lag, all diam. longer than 6 in.	39	44 1/2	47	48 1/2
Flow bolts, 1/2" and smaller x 6" and shorter	49	54	56	57

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
3/4 in. or smaller	60 1/2
1/2 in. to 1 in. inclusive	55 1/2
1 1/4 in. to 1 1/2 in. inclusive	58 1/2
1 1/2 in. and larger	63 1/2

C. P. Hex, reg. & hvy.	
3/4 in. and smaller	60 1/2
1/2 in. to 1 1/4 in. inclusive	55 1/2
1 1/4 in. and larger	63 1/2

Hot Galv. Hex Nuts (All Types)	
3/4 in. and smaller	46 1/2

Semi-finished Hex Nuts	
3/4 in. or smaller	60 1/2
1/2 in. to 1 1/4 in. inclusive	55 1/2
1 1/4 in. and larger	63 1/2

(Add 25 pct for broken case or keg quantities)

Finished	
3/4 in. and smaller	63

Rivets	Base per 100 lb
1/2 in. and larger	\$12.25
7/16 in. and smaller	19

Pct. Off List

Cap Screws	Discount (Packages)
Full Finished H. C. Heat Treat	

New std. hex head, packaged	
1/2" diam. and smaller x 6" and shorter	40
3/8", 1/2", and 1" diam. x 6" and shorter	23
1/2" diam. and smaller x longer than 6"	8
3/8", 1/2", and 1" diam. x longer than 6"	+ 13

C-1018 Steel Full-Finished Cartons Bulk

1/4" through 3/4" dia. x 6" and shorter	58
3/4" through 1" dia. x 6" and shorter	45
Minimum quantity—1/4" through 3/4" diam., 5,000 pieces; 3/4" through 1" diam., 2,000 pieces.	33

Machine Screws & Stove Bolts	Discount
Plain Finish	Mach. Stove
Cartons	60
Bulk	60

To 1/4" diam. incl.	25,000-and over	60
5/16 to 1/2" diam. incl.	15,000-200,000	60

Machine Screws & Stove Bolt Nuts			
		Discount	
In Cartons	Quantity	Hex	Square
In Bulk		16	19
1/4" diam. & smaller	25,000 and over	14	16

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.7
Chicago	140.9
San Francisco-L. A.	145.6

Dec. 1955, value, Class B or heavier 2 in. or larger, bell and spigot pipe. Explanation: p. 57 Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

ELECTROPLATING SUPPLIES

Anodes	
(Cents per lb, fct allowed in quantity)	
Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	40.00
Electrodeposited	31.25
Brass, 80-20, ball anodes, 2000 lb or more	44.00
Zinc, ball anodes, 2000 lb lots (for elliptical add 1¢ per lb)	16.50
Nickel, 99 pct plus, rolled carbon, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.55
Tin, ball anodes \$1.13 per lb (approx.)	

Chemicals	
(Cents per lb, f.o.b. shipping point)	
Copper cyanide, 100 lb drum	68.70
Copper sulphate, 100 lb bags, per cwt.	22.15
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed, 300 lb	48.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	24.05
(Philadelphia price 24.50)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum	48.00
N. Y.	
Chromic acid, flake type, 10,000 lb or more	31.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots for minus 100 mesh	
Swedish sponge iron, del. East of Miss. River, ocean bags, 23,000 lb. and over	10.5¢
F.O.B. Riverton or Camden, New Jersey, west of Miss. River	9.5¢
Domestic sponge iron, 98+ % Fe, 23,000 lb. and over del'd East of Miss. River	10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River	9.5¢
Canadian sponge iron, del'd in East, carloads	10.5¢
Electrolytic iron, annealed, imported 99.5+ % Fe	27.5¢
domestic 99.5+ % Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+ % Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	27.0¢
Carbonyl iron size 3 to 20 micron, 98%, 99.8+ % Fe	\$8.0¢ to \$2.85
Aluminum, freight allowed	38.00¢
Brass, 10 ton lots	31.1¢ to 47.1¢
Copper, electrolytic	\$1.05¢
Copper, reduced	40.3¢ to 48.8¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99.85% min. Fe. 03 max. Del'd	\$5.00
Lead	21.50¢ lb, f.o.b. plant
Manganese f.o.b. Extron, Pa.	46.0¢
Molybdenum, 99%	\$3.60 to 33.95
Nickel, chemically precipitated	\$1.05
Nickel, unannealed	\$1.00
Nickel, annealed	\$1.06
Nickel, spherical, unannealed	\$1.13
Silicon	43.50¢
Solder powder	13¢ plus met. value
Stainless steel, 302	\$1.02
Stainless steel, 316	\$1.30
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh) \$3.15 (nominal)	
Zinc, 5000 lb & over	17.5¢ to 30.7¢

WARE-HOUSES

Cities	City Charge	Metropolitan Price, dollars per 100 lb.									
		Sheets		Strip	Plates	Shapes	Bars				
		Hot-Rolled (10 ga. & over)	Cold-Rolled (16 gage)	Galvanized (10 gage)	Hot-Rolled	Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4015	Hot-Rolled 4140	Hot-Rolled 4615
Atlanta		8.59	9.87	10.13	8.64	8.97	9.05	9.81	10.68		
Baltimore	\$1.10	8.38	9.98	9.78	8.86	8.76	9.29	9.16	10.69	16.28	15.28
Birmingham	.15	8.18	9.45	10.15	8.23	8.56	8.64	8.60	10.57		
Boston	.10	9.48	10.54	11.55	9.52	9.82	9.73	9.83	13.00	16.38	15.38
Buffalo	.15	8.40	9.15	11.22	8.65	9.05	9.05	8.95	11.05	16.34	15.15
Chicago	.15	8.35	9.60	10.25	8.38	8.71	8.79	8.75	8.95	15.00	14.80
Cincinnati	.15	8.49	9.65	10.25	8.69	9.06	9.33	9.07	9.46	15.61	15.11
Cleveland	.15	8.33	9.60	10.35	8.48	8.94	9.16	8.84	10.95	15.80	14.89
Denver	.20	9.70	11.30	12.49	9.80	9.70	9.80	9.98	10.65		
Detroit	.15	8.58	9.85	10.60	8.73	9.06	9.33	9.05	9.30	15.46	15.06
Houston		7.10	8.05		7.25	8.05	7.25	7.20	11.10	16.20	15.25
Kansas City	.20	9.02	10.27	10.82	9.05	9.38	9.46	9.42	9.67	20.02	15.47
Los Angeles	.10	9.70	9.50	11.00	8.65	8.65	8.70	8.80	12.10	17.05	16.10
Memphis	.15	8.55	9.80		8.60	8.93	9.01	8.97	12.11		
Milwaukee	.15	8.48	9.73	10.38	8.51	8.84	9.00	8.88	9.18	15.93	14.93
New York	.10	8.97	10.23	10.66	9.41	9.53	9.45	9.67	12.84	16.19	15.19
Norfolk	.20	8.20			8.90	8.65	9.20	8.90	10.70		
Philadelphia	.10	8.10	9.00	10.02	8.79	8.87	8.60	8.75	11.61	16.11	15.11
Pittsburgh	.15	8.33	9.60	10.60	8.48	8.71	8.79	8.75	10.95	15.80	14.80
Portland		10.00	11.75	13.30	11.95	10.10	11.10	9.85	11.34	18.50	17.45
San Francisco	.10	9.45	10.85	11.10	9.55	9.70	9.60	9.80	13.10	17.05	16.10
Seattle		9.95	11.15	12.20	10.80	9.70	9.80	10.10	14.05	17.15	16.35
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20		
St. Louis	.15	8.60	9.94	10.61	8.74	9.08	9.25	9.12	9.56	16.16	15.16
St. Paul	.15	8.94	10.19	10.86	8.99	9.45	9.53	9.37	9.81		

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. *All sizes except 18 and 16 gage.
† 106 sine. ‡ Deduct for country delivery. * C1018—1 in. rounds. † 10 ga. x 36" x 120".
§ 20 ga. x 36" x 120". ¶ 36 ga. x 36" x 96". † 1/4" x 1" in lots of 1000 to 9999; † annealed plate 1/4" x 84" in lots of 1000 to 9999; † 3" x 5.70" in lots of 1000 to 9999; † M-1020—1-in. rounds in lots of 1000 to 9999.

(Effective May 5, 1958)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	\$1.795	T-1
18	4	1	—	5	2.50	T-4
18	4	2	—	—	1.96	T-2
1.5	4	1.5	8	—	1.555	M-1
6	4	2	8	—	1.545	M-3
6	4	2	5	—	1.30	M-2
High-carbon chromium..						.925 D-3, D-5
Oil hardened manganese						.475 O-2
Special carbon .....						.36 W-1
Extra carbon .....						.36 W-1
Regular carbon .....						.305 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb. f.o.b.

Cladding	Plate (A3, J2, L4, C9)			Sheet (I2)	
	10 pct	15 pct	20 pct	20 pct	
302					37.50
304	37.95	42.25	46.70		40.00
316	44.40	49.50	54.50		58.75
321	40.05	44.60	49.30		47.25
347	42.40	47.55	52.00		57.00
405	29.85	33.35	36.85		
410	29.55	33.10	36.70		
430	29.80	33.55	37.25		

CR Strip (S9) Copper, 10 pct, 2 sides, 38.75; 1 side, 33.10.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rail	Light Rail	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Unthreaded
Bessemer U1	5.525	6.50	6.975				
Cleveland R3							14.75
So. Chicago R3	5.525	6.50		9.75			
Ensley T2		6.50		9.75		6.60	
Fairfield T2	5.525					6.60	
Gary U1		6.50					
Huntington C16	5.525		6.975	9.75		6.60	
Ind. Harbor I1			6.975	9.75			
Ind. Harbor Y1							
Johnstown B3		6.50					
Jolet U1			6.975				
Kansas City S2				9.75			14.75
Lackawanna B3	5.525	6.50	6.975			6.60	
Lebanon B3			6.975		14.50		14.75
Minnequa C6	5.525	7.00	6.975	9.75		6.60	14.75
Pittsburgh P5							
Pittsburgh J3				9.75			
Seattle B2				10.25		6.75	15.75
Steelton B1	5.525		6.975			6.60	
Struthers Y1				9.75			
Torrance C7						6.75	
Williamport S5		6.50					
Youngstown R3				9.75			

COKE

Furnace, beehive (f.o.b.) Net-Ton
Connellsville, Pa. \$15.00 to \$15.75
Foundry, beehive (f.o.b.) \$17.50 to \$19.00

Foundry oven coke

Buffalo, del'd	\$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Is., Pa.	29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1958 season. Freight changes for seller's account.

Gross Ton	
Openhearth lump	\$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length)	
		Semi-Processed	Fully Processed
Field		9.625	
Armature	11.10	10.85	11.35
Elect.	11.60	11.55	12.05
Special Motor		12.10	
Motor	12.90	12.65	13.15
Dynamo	13.95	13.70	14.20
Trans. 72	15.00	14.75	15.25
Trans. 65	15.55		
Grain Oriented			
Trans. 58	16.05	Trans. 66	20.20
Trans. 52	17.10	Trans. 80	19.20
		Trans. 73	19.70

Producing points: Beech Bottom (W5); Brackenridge (A3); Granite City (G2); Indiana Harbor (I3); Mansfield (E2); Newport, Ky. (A9); Niles, O. (N3); Vandergrift (U); Warren, O. (R3); Zanesville, Butler (A7).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	84	26.00	40	100, 110	10.70
20	72	25.25	35	110	10.70
18	72	25.75	30	110	10.85
14	72	25.75	24	72 to 84	11.25
12	72	26.25	20	90	11.00
10	60	26.00	17	72	11.40
10	48	26.50	14	72	11.85
7	60	28.25	12	60	12.95
6	60	31.50	10	60	13.00
4	40	35.00	8	60	13.30
3	40	37.00			
2 1/2	30	39.25			
2	24	50.75			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000
First quality, Ill. Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5.00) \$135.00
No. 1 Ohio .. 120.00
Sec. Quality, Pa., Md., Ky., Mo., Ill. 120.00
No. 2 Ohio .. 103.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$2.00) 21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala. \$150.00
Childs, Hays, Pa. 155.00
Chicago District .. 160.00
Western Utah .. 175.00
California .. 180.00

Super Duty

Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville 157.00-160.00

Silica cement, net ton, bulk, Latrobe 28.50
Silica cement, net ton, bulk, Chicago 25.50
Silica cement, net ton, bulk, Ensley, Ala. 26.50
Silica cement, net ton, bulk, Mt. Union 24.50
Silica cement, net ton, bulk, Utah and Calif. 37.00

Chrome Brick

Standard chemically bonded, Balt. \$105.00
Standard chemically bonded, Curt-ner, Calif. 115.00
Burned, Balt. 99.00

Magnesite Brick

Domestic Baltimore .. \$131.00
Chemically bonded, Baltimore .. 116.00

Grain Magnesite

St. % to 3/4-in. grains
Domestic, f.o.b. Baltimore in bulk. \$73.00
Domestic, f.o.b. Chewelah, Wash., Luning, Nev. 46.00
In sacks .. 52.00-54.00

Dead Burned Dolomite

Per net ton
F.o.b. bulk, producing points in: Pa., W. Va., Ohio \$16.75
Midwest 17.00
Missouri Valley 15.00

(Effective May 5, 1958)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails		Fence Posts		Single Loop Bala Ties		Galv. Barbed and Twisted Barbed Wire		Merch. Wire Ann'd		Merch. Wire Galv.	
	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col
Alabama City R3	173	187		212	193		8.65	9.20				
Alquippa J3***	173	190			190		8.65	9.325				
Atlanta A8**	175	192		214	196		8.75	9.425				
Bartonville K2**	175	192		218	214	196	8.75	9.425**				
Buffalo H6							8.65	8.95*				
Chicago N4***	173	190		212	212	196	8.65	9.325				
Cleveland A6							8.65					
Cleveland A5							8.65					
Crawfords M4**	175	192		214	198		8.75	9.425				
Dona, Pa. A5	173	187		212	193		8.65	9.20				
Duluth A5	173	187		212	193		8.65	9.20				
Fairfield, Ala. T2	173	187		212	193		8.65	9.20				
Galveston D4	9.10											
Houston S2	178	192		217	195		8.90	9.45				
Jacksonville M4	184-1	197		219	203		9.00	9.675				
Johnstown B3**	173	190		212	196**		8.65	9.325**				
Jolet, Ill. A5	173	187		212	193		8.65	9.20				
Kokomo C9*	175	189		214	195*		8.75	9.30*				
L. Angeles B2***							9.60	10.275				
Kansas City S2*	178	192		217	198*		8.90	9.45*				
Minnequa C6†	178	192		217	198†		8.90	9.45†				
Monesson P6							193	8.65	9.20			
Palmer, Mass. W6							8.95	9.50*				
Pittsburg, Cal. C7	192	210			213		9.60	10.15				
Rankin, Pa. A5	173	187					8.65	9.20				
So. Chicago R3	173	187					8.65	9.20				
S. San Fran. C6†					236		9.60	10.15†				
Sparrows Pt. B3**	175			214	198		8.75	9.425				
Sterling, Ill. N4***	175	192		212	214	198	8.75	9.425				
Struthers, O. Y1*							8.65	9.20				
Worcester A5	179						8.95	9.50				
Williamport S5												

* Zinc less than .10%.

** 11-12% zinc.

*** .10% zinc.

† Plus zinc extras.

‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT				
	0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.00	1.01-1.35
Baltimore, Md. T3	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. W12		10.70	12.90	15.10	19.30
Boston T8	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. R7	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. S9	8.95	10.40	12.60	15.60	18.55
Cleveland A5	8.95	10.40	12.60	15.60	18.55
Daraborn S1	9.05	10.50	12.70		
Detroit D1	9.05	10.50	12.70	15.70	
Detroit D2	9.05	10.50	12.70		
Dover, O. C4	8.95	10.40	12.60	15.60	18.55
Evansville, Ill. M8	9.05	10.40	12.60		
Franklin Park, Ill. T8	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. C11		12.90	15.10	19.30	
Indianapolis J3	9.10	10.55	12.60	15.60	18.55
Los Angeles C7	11.15	12.60	14.80	17.90	
New Castle, Pa. B4	8.95	10.40	12.60	15.60	
New Haven, Conn. D1	9.40	10.70	12.90	15.90	
Pawtucket, R. I. N7	9.50	10.70	12.90	15.90	18.85
Pittsburgh S7	8.95	10.40	12.60	15.60	18.55
Riverdale, Ill. A1	8.95	10.40	12.60	15.60	18.55
Sharon, Pa. S1	8.95	10.40	12.60	15.60	18.55
Trenton R4	8.95	10.40	12.60	15.60	18.55
Wallingford W1	9.40	10.70	12.90	15.90	18.85
Warren, Ohio T4	8.95	10.40	12.60	15.60	18.55
Worcester, Mass. A5	9.50	10.70	12.90	15.90	18.85
Youngstown J3	8.95	10.40	12.60	15.60	18.55

BOILER TUBES

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FIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Beas.	Low Phos.
Birdsboro, Pa. B6	68.00	68.50	69.00	69.50	
Birmingham R3	62.00	62.50*			
Birmingham W9	62.00	62.50*	66.50		
Birmingham U4	62.00	62.50*	66.50		
Buffalo R3	66.00	66.50	67.00	67.50	
Buffalo H1	66.00	66.50	67.00	67.50	
Buffalo W6	66.00	66.50	67.00	67.50	
Chester P2	66.50	67.00	67.50		
Chicago I4	66.00	66.50	66.50	67.00	
Cleveland A5	66.00	66.50	66.50	67.00	71.00†
Cleveland R3	66.00	66.50	66.50	67.00	
Dueth I4	66.00	66.50	66.50	67.00	71.00†
Erie I4	66.00	66.50	66.50	67.00	71.00†
Everett M6	67.50	68.00	68.50		
Fontana K1	75.00	75.50			
Geneva, Utah C7	66.00	66.50			
Granite City G2	67.90	68.40	68.90		
Hubbard Y1			66.50		
Ironton, Utah C7	66.00	66.50			
Midland C11	66.00				
Minnequa C6	68.00	68.50	69.00		
Monessen P6	66.00				
Neville Is. P4	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda T1	66.00	66.50	67.00	67.50	
Sharpville S1	66.00	66.50	66.50	67.00	
So. Chicago R3	66.00	66.50	66.50	67.00	
So. Chicago W8	66.00	66.50	66.50	67.00	
Swedeland A2	68.00	68.50	69.00	69.50	
Toledo I4	66.00	66.50	66.50	67.00	
Troy, N. Y. R3	68.00	68.50	69.00	69.50	74.00
Youngstown Y1			66.50	67.00	

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct); 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct; 32¢ per ton for 0.50 to 0.75 pct nickel; 51¢ for each additional 0.25 pct nickel. Add \$1.00 for 0.31-0.60 pct phos.

Silvery Iron: Buffalo (6 pct), H1, \$79.25; Jackson J1, I4 (Globe Div.), \$78.00; Niagara Falls (15.01-15.50), \$101.00; Keokuk (14.01-14.50), \$103.50; (15.51-16.00), \$106.50. Add \$1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add \$1.25 for each 0.50 pct manganese over 1.00 pct. Reassess silvery pig iron (under 10 pct phos.); \$64.00. Add \$1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingot, re-roll	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	50.00	50.75	76.75	59.75	69.75	48.25	35.00	36.75	36.00
Sheets	48.50	49.25	51.25	52.00	—	55.00	80.75	65.50	79.25	48.25	40.25	—	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	—	55.00	80.75	65.50	79.25	48.25	40.25	—	40.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; Vandergrift, Pa., U1; Washington, Pa., W2, J2; Baltimore, E1; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Detroit, M2.

Strip: Midland, Pa., C11; Waukegan, Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leeburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Canton, Massillon, O., R3; Harrison, N. Y., D3; Youngstown, J3; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (plus further conversion extras); W1 (.25¢ per lb higher); New Bedford, Mass., R6; Gary, U1 (.25¢ per lb higher).

Bar: Baltimore, A7; S. Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1, F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R5; S. Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A5; Canton, O., T5, R3; Ft. Wayne, I4; Detroit, R5; Gary, U1; Owensboro, Ky., G5; Bridgeport, Conn., N8.

Wire: Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Harrison, N. Y., D3; Baltimore, A7; Dunkirk, A3; Monessen, P1; Syracuse, C11; Bridgeville, U2.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11; S. Chicago, U1.

Plates: Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Coatesville, Pa., C13; Vandergrift, Pa., U1; Gary, U1.

Forging billets: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R5; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11; Detroit, R5; Munhall, Pa., S. Chicago, U1; Owensboro, Ky., G5; Bridgeport, Conn., N8.

(Effective May 5, 1958)



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CF&I OFFICES IN CANADA: Montreal • Toronto
CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.			
0.02% C.....	41.00	0.50% C.....	38.00
0.05% C.....	39.00	1.00% C.....	37.75
0.10% C.....	38.50	1.50% C.....	37.50
0.20% C.....	38.25	2.00% C.....	37.25
4.00-4.50% C, 60-70% Cr, 1-2% Si.....	28.75		
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si.....	27.50		
0.025% C (Simplex).....	36.75		
0.10% C, 52-57% Cr, 2.00% max Si.....	37.50		
7-8½% max C, 50-55% Cr, 3-6% max Si.....	22.50		
7-8½% max C, 50-55% Cr, 3% max Si.....	25.00		

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.	
0.10% max. C.....	\$1.31
0.50% max. C.....	1.31
9 to 11% C, 88-91% Cr, 0.75% Fe.....	1.40

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (½" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.	
Carloads.....	\$1.29
Ton lots.....	1.31
Less ton lots.....	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.			
Price is sum of contained Cr and contained Si.			
	Cr	Si	
Carloads, bulk.....	27.50	14.20	
Ton lots.....	32.75	15.65	
Less ton lots.....	34.35	17.30	

Calcium-Silicon

Per lb of alloy, lump, delivered, packed, 30-33% Cr, 60-65% Si, 3.00 max. Fe.	
Carloads.....	25.65
Ton lots.....	27.95
Less ton lots.....	29.45

Calcium-Manganese-Silicon

Cents per lb of alloy, lump, delivered, packed, 16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads.....	24.25
Ton lots.....	26.15
Less ton lots.....	27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.	
Ton lots.....	21.15
Less ton lots.....	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn, packed.	
Carload lots.....	18.45
Ton lots.....	19.55
Less ton lots.....	21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.	
Carload packed.....	19.20
Ton lots to carload packed.....	21.15
Less ton lots.....	22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.: Alloy, W. Va.: Sheffield, Ala.: Portland, Ore.....	12.25
Johnstown, Pa.....	12.25
Neville Island, Pa.....	12.25
Sheridan, Pa.....	12.25
Philo, Ohio.....	12.25
S. Duquesne.....	12.25
Add or subtract 0.1¢ for each 1 pct Mn above or below base content.	
Briquets, delivered, 66 pct Mn:	
Carloads, bulk.....	14.80
Ton lots packed in bags.....	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.	
Manganese	Silicon
18 to 19%.....	3% max.....\$100.50
19 to 21%.....	3% max.....102.50
21 to 23%.....	3% max.....105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.	
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.....	45.75
Carload, packed.....	47.25
Ton lots.....	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.	
Carloads.....	34.00
Ton lots.....	36.00
250 to 1999 lb.....	38.00
Premium for Hydrogen-removed metal.....	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn.....	
	25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%.			
	Carloads	Ton	Less
0.07% max. C, 0.06% (Bulk)			
P, 90% Mn.....	37.15	39.95	41.15
0.07% max. C.....	35.10	37.90	39.10
0.10% max. C.....	34.35	37.15	38.35
0.15% max. C.....	33.60	36.40	37.60
0.30% max. C.....	32.10	34.90	36.10
0.50% max. C.....	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si.....	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.	
Carloads bulk.....	12.80
Ton lots, packed.....	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet.....	15.10
Packed, pallets, 3000 lb up to carloads.....	16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$106.50 gross ton, freight allowed to normal trade area.	
Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00.	

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.		
	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe.....	24.20	22.90
98% Si, 0.75% Fe.....	24.95	23.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.	
Carloads, bulk.....	7.70
Ton lots, packed.....	10.50

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.			
50% Si.....	14.20	75% Si.....	16.40
65% Si.....	15.25	85% Si.....	18.10
90% Si.....	19.50		

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.	
Openhearth.....	3.20
Crucible.....	3.30
High speed steel (Primos).....	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.			
Ton lots.....	Cast \$2.05	Turnings \$2.95	Distilled \$3.75
100 to 1999 lb.....	2.40	3.30	4.55

(Effective May 5, 1958)

Alisifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.	
Carloads, bulk.....	10.35¢
Ton lots.....	11.70¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo.....	
	\$1.28

Ferrocolumbium, 50-50%, 2 in. x D, delivered per pound contained Cb.	
Ton lots.....	\$4.00
Less ton lots.....	4.05

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb cont Sb plus Ta.....	
	\$3.80

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.....	
	\$1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, MT. Pleasant, Tenn., \$4.00 unitage, per gross ton.....	
10 tons to less carload.....	\$90.00
	\$110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti.....	
	\$1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti.....	
Less ton lots.....	\$1.50
	\$1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton.....	
	\$240.00

Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered.....	
	\$2.15
	(nominal)

Molybdenic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa.,.....	
	\$1.41
bags, f.o.b. Washington, Pa. Langeloth, Pa.,.....	
	\$1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.....	
Carload, bulk lump.....	18.50¢
Ton lots, packed lump.....	20.50¢
Less ton lots.....	21.00¢

Vanadium oxide, 86-89% V ₂ O ₅ per pound contained V ₂ O ₅	
	\$1.38

Zirconium, per lb of alloy 33-40% f.o.b. freight allowed, carloads, packed.....	
12-15%, del'd lump, bulk-carloads.....	27.25¢
	9.25¢

Boron Agents

Borasil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B.....	
2000 lb carload.....	\$5.50

Bortram, f.o.b. Niagara Falls. Ton lots per pound.....	
Less ton lots, per pound.....	45¢
	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.	
Ton lots per pound.....	14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.....	
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up.....	\$1.20
10 to 14% B.....	.85
14 to 19% B.....	1.20
19% min. B.....	1.50

Grinal, f.o.b. Cambridge, O., freight allowed, 100 lb and over No. 1.....	
No. 79.....	\$1.05
	60¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.	
Ton lots (packed).....	\$1.46
Less ton lots (packed).....	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots.....	
	2.15

GOSS and DE LEEUW

MULTIPLE SPINDLE

CHUCKING MACHINES

Four, Five, Six, Eight Spindles • Work and Tool Rotating Type
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

FORGINGS

ALL SIZES, pressed . . . rolled . . . extruded . . . forged to accurate specifications from carbon, alloy, stainless steels and special metals. Modern metallurgical, die, heat-treating and rough machining facilities.

Over 50 years of forging design and development
THE CANTON DROP FORGING & MFG. CO.
CANTON, OHIO

MUNDT

PERFORATED METALS

The few perforations illustrated are indicative of the wide variety of our line—we can perforate almost any size perforation in any kind of metal or material required. Send us your specifications.

Sixty-seven years of manufacturing perforated metals for every conceivable purpose assure satisfaction.

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TIN, STEEL, COPPER, ALUMINUM, BRONZE,
BRASS, ZINC, ANY METAL, ANY PURPOSE

CHARLES MUNDT & SONS

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for Corrugating and Complete Line of Culvert Equipment—Slitting and Coiling Equipment for Ferrous and Non-Ferrous Material in All Capacities—Warehouse and Steel Mill Cut to Length Lines for Shearing and Levelling Sheets from Coils—Shears for Shearing Sheets and Plates Both Underdriven and Overdriven Types in Capacities to 1¼" Plate.

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COIL SPRING SAYS:

You're roping a first class spring when you latch onto U.S. Steel Wire Spring



Take it from us, U. S. Steel Wire springs are tops. They're made according to exact specifications because our modern facilities are especially geared to produce only springs, wire forms and small parts. Limited quantities or long production runs, we give all orders the speedy service they deserve. Try us for your next spring order.

No order too large or too small!

The U. S. STEEL WIRE SPRING Co.

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CLEVELAND 5, OHIO

ELECTRICAL POWER EQUIPMENT IN STOCK DC MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	3900	New Elliott	Enc. F.V.	475	320
2	3000	New Whas.	Enc. F.V.	535	600
1	2250	New Elliott	Enc. F.V.	600	200/300
1	2200	G.E.	MCF	600	400/500
1	1750	New Elliott	Enc. F.V.	250	175/350
1	1500	Whas.	Enc. F.V.	525	600
4	1500	Whas.	Enc. F.V.	525	600
1	1375	G.E.	MCF	415	1300
1	1300	G.E.	MCF-12	300	200/400
1	1200	G.E.	MCF	600	450/600
1	1000	Whas.	Enc. F.V.	500	800/2000
1	940	Whas.	QM	250	140/170
2	800	G.E.	MCF	250	400/750
2	750	G.E.	MCF	600	450/900
1	750	G.E.	MCF	600	300/720
1	750	G.E.	MCF	600	120/360
4	600	Whas.	Enc. F.V.	250	275/550
1	500	G.E.	TLF-245EH	250	2000/4000
1	500	G.E.	MFC-10	250	188/400
3	450	Whas.	Enc. F.V.	550	415
2	400	G.E.	CY-375	300	1000/1500
1	300	Cr. Wh.	E-102 B.B.	250	1200
2	300	G.E.	MCF-6	250	190/380
2	300	G.E.	MFC	230	400
2	275	G.E.	TLO-108	250	2000/4000
1	250	G.E.	MDP-614AE	425	950
1	225	G.E.	TLO-110	250	1150/3600
1	200	Whas.	CB374	250	800/1200
1	150	Cr. Wh.	CMC-65H	280	1150
1	150	G.E.	CD. B.B.	600	250/750
1	150	G.E.	TLC-74 B.B.	250	1150/3500
1	120	G.E.	TLC-50 B.B.	250	1850/5000
1	125/150	Whas. New	CB-310.3	250	300/1500
1	120	Rad.	1050T B.B.	230	575/900
2	125	Whas.	SK-180	230	450/1200
1	125	Whas.	SK-185	230	350/1050
1	100	G.E.	CDP-115	250	450/1000
2	100	Whas.	SK-181	230	450/1000
1	75	G.E.	B.B. CD-1235 D.P.	600	850
6	40	Rel.	B.B. 845F, TEFC	250	500/1500

MERCURY ARC RECTIFIERS

3-150 KW, G.E., Sealed Tube Ignitron Unit Substation lead centers 275 V, D.C., 2000 V, A.C. Pyranol filled transformers complete.
2-150 KW, G.E., Ignitron, 245 V, D.C.—220 V, A.C., air cooled transformers with controls.

MG SETS—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	DC Volts	AC Volts
1	2000	G.E.	514	600	2500/4000
2	1750/2100	G.E.	514	250/300	2300/4000
1	1500	G.E.	720	600	6000/12000
1	1500	G.E.	600	600	2500/4150
2	1000	G.E.	720	600	6000/12000
2	750	G.E.	720	250/300	6000/12000
1	500	Whas.	900	125/250	440
1	500	G.E.	900	125/250	440
1	350	G.E.	900	125	440/2200/4160
1	300	G.E.	1200	250	2300/4000
1	300	G.E.	1200	250	440/2300
2	250	Whas.	1200	250/275	2300
1	200	G.E.	1200	250	440/550
1	200	Whas.	1200	550	2200
1	200	El. Mfg.	1200	250	2300/4000
1	150	G.E.	1200	275	2500
1	150	Whas.	1200	275	2500
1	150	G.E.	1200	125	440
1	140	Cr. Wh.	600	125/250	2300
1	100	G.E.	1170	250	220/440
1	100	Cr. Wh.	1000	250	220/440
2	100	Cr. Wh.	1100	525	220/550
1	100	G.E.	1200	250	2400/4100
2	75	Whas.	1200	125	440

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Volts
3	3333	Whas.	OISC	1	13800 x 2300
1	1500	G.E. auto	HT	3	4000/4200/4400
3	1000	G.E.	HYDDJ	1	2400 x 480
3	1000	G.E.	OA/FA	1	13800 x 230/460
2	750	G.E.	Pyranol	1	4800x85/55-255/185
3	500	Kuhl	OISC	1	13200 x 6600
3	353	G.E.	OISC	1	13200 x 2530/1200V
3	150	G.E.	OISC	1	33000x2300/4000V
3	100	Whas.	SK	1	4600x460/230/115

CRANE & MILL MOTORS

Qu.	H.P.	Make	Type	Ph.	Volts
14	12/15	Whas.	750/500	MCA-30, Series	
1	20	Whas.	975	K-5, Series	
2	23	G.E.	650	MDS-108.	
2	25	G.E.	735	CO-1008, Series	
1	35	Whas.	480	CK-9 Comp. S.B.	
1	35	Whas.	480	CK-9 Sh. R.B.	
1	45	Whas.	600	CK-9 Comp. S.B.	
3	50	G.E.	650	COM-1830 Comp.	
3	50	Whas.	625	CK-9 Shunt R.B.	
2	50	Whas.	600	CK-9 Comp. R.B.	
1	50	G.E.	650	MD-412AE 2	
1	50	Cr. Wh.	550	Comp. R.B.	
1	100	G.E.	475	RW-50 Comp.	
6	100/140	Whas.	500/415	CO-1832	
9	125	G.E.	625	Series S.B.	
				Series R.B.	
				CO-1832	
				Series S.B.	

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Tel. Oldfield 3-3334

THE CLEARING HOUSE

Chicago Dealers Hold Previous Gains

Used machinery sales in Midwest stayed at March levels again last month.

Sellers expect rest of second quarter will be at the same pace.

■ Gains in used machinery sales made in the Chicago area in March failed to continue through April. But neither did business drop off.

Machinery rebuilders are operating with a zero backlog. But they are continuing to rebuild machine tools at about the same rate they reached in March. And March ended a three-month sales gain from a low point that was hit in December of last year.

Prices Strong — Reconditioned and "as is" machine tools are holding equally well. Prices have not weakened. Most dealers argue they would make more sales if they could locate tools at prices on which they could show a fair profit.

Detroit business, even for Chicago dealers, has been a sleeper. Sales of light tools, toolroom equipment, and light presses of the off-the-shelf variety to Detroit buyers has been surprisingly strong.

Equipment sales generally have favored lighter, toolroom equipment. Foreign and heavy production equipment has fallen while lighter tools have shown significant gains. But here's a switch that has some dealers testing the wind carefully. In the past two weeks there have been several important sales of heavy, production line tooling including milling machines, grinders, and lathes. This wasn't the pattern in March, when toolroom

equipment had the sales scene pretty much to itself.

No Gains, No Drops — Most dealers feel that tool business will show no significant drops through May and June. But neither will it show any real gains. Following the usual summer lull in July and August, a fairly strong fourth quarter pickup is expected.

As is usual in the spring, presses, press brakes, shears, and bending rolls are moving well—where the dealer can get his hands on something to sell. Prices for these tool types seem particularly firm, and on at least several occasions have shown a tendency to inch up.

Leveling Helps—The upshot of it all: Business isn't displaying the gains it made during the first quarter. It topped out in April and at the moment business levels are holding even with March. On the other hand, holding at the current pace will boost second quarter totals well over the first quarter dollar volume total. With April already complete, the used tool industry has already put in one month on a par with the best month it had in first quarter.

Selling Takes Work—The tendency of prices to hold at present levels is regarded as highly significant. There's a lot of talk of business going sour. Yet no one will shave his asking price to step up volume. Sellers have certainly worked harder than they have at any time in the past five months. In doing so, they've made some good ones, and haven't had to cut prices.

CONSIDER GOOD USED EQUIPMENT FIRST

ANGLE BENDING ROLL

3 x 3 x 1/2" Buffalo No. 1 Angle Bending Roll

SALES

Model #128-PX-66 Logemann, Rolling Chamber 66 x 14 x 18"

BENDER & STRAIGHTENER

Full Type 3K All Steel Bender & Straightener for Beams, Channels, Angles, Tees—Angles Equal & Tees 2 x 2 x 1/4"

BENDING ROLLS

8' x 1/2" Berlich Initial Type
18' x 1/2" King Pyramid Type
12' x 5/16" Berlich Initial Type
18' x 1" Milas Pyramid Type

BRAKE—PRESS TYPE

10' x 1/2" & 12' x 1/2" Hydraulic—NEW

CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P&H 50' Span 220 Volt D.C.
5 ton Shepard Niles 74' Span 220 Volt D.C.
7 1/2 ton P&H 48' Span 220 Volt D.C.
8 ton P&H 35' Span 220/240
10 ton P&H 39' Span 220 Volt D.C.
10 ton Shaw 48' Span 220 Volt D.C.
10 ton P&H 35' Span 220 Volt D.C.
10 ton Shaw 130' Span 220 Volt D.C.
15 ton Northern 84' Span 220 Volt D.C.
15 ton Shepard Niles 68' Span 220 Volt D.C.
20 ton Shepard Niles 98' Span 220 Volt D.C.
20 ton P&H 108' Span 220 Volt D.C.
120 ton Shepard Niles 77' Span 220/240

DRAW BENCH

10,000 lb. Aetna Standard Single Draw 44 Ft. Length of Draw

FLANGING MACHINE

1/2" McCabe Pneumatic Flanging Machine

FORGING MACHINES

1" to 8" Ames, Ajax, National

FURNACE—MELTING

15 ton Herault Top Charge, 19" Shell

HAMMERS—BOARD DROP—STEAM DROP—STEAM

FORGING 220 lb. to 12,000 lb. Incl.

LEVELERS—ROLLER

37" Turrington, 19 Ralls 1 1/2/33" dia.

44" Newbold, 9 Ralls 4" dia.

60" Ames Standard, 17 Ralls 4 1/2" dia.

PLATE DUPLICATOR

No. 12 Thomas Steel Bld. Punch Capacity 150 tons

Table Area for handling 6' x 16' Plates

PRESSES—HYDRAULIC

600 ton HPM Extruder, Bed 36" x 36"

600 ton Elmas, 58" Stroke, 4545" Bed, Coia.

1500 ton Bilas 18" Stroke, Bed 48" x 48"

1800 ton Mesta Stearn Hydr. Forging Press

4500 Baldwin-Lima-Hamilton Hydr. Forging Press

PRESSES—STRAIGHT SIDE

180 ton Hamilton #947, 15" Str. 35 1/2" Bed, Up.

280 ton Clearing F1250-43, Stroke 38", Bed 44"x38"

350 ton Bilas 81 7/8" Str. Blstr. 33"x30"

PUNCH & SHEAR COMBINATIONS

Cleveland Style C; Arch Jaw, Capr. 1 1/2" x 1/2"

Cleveland Style EP; Arch Jaw, Capr. 1 1/2" x 1"

TORRINGTON FLAT WIRE MILL LINE

Two Stand Two High 4" x 5", Comp. with Ass.

ROLLING MILLS

6" x 1" Three Stand Wire, Rolling Mill Complete

with Pay Off & Reeler

8" x 10" Single Stand Two High

10" x 14" Single Stand Two High

10" x 16" Single Stand Two High

12" x 18" Single Stand Two High

12" x 18" Single Stand Two High

16" x 24" Single Stand Two High

20" x 36" Single Stand Two High

ROLLS—FORMING

6 Stand Yoder M-1 1/2

18 Stand Custom Built, 2 1/2" Shaft, will take 88" wide

ROLLS—PLATE STRAIGHTENING

108" Berlich, Seron Ralls 9" Dia.

72" Niles 7 Ralls 9" Dia. Motor Drive

SHEAR—ALLIGATOR

No. 4 Mesta RH L&K, Capacity 2" x 12"

SHEAR—ANGLE

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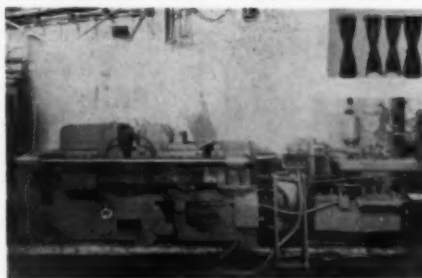
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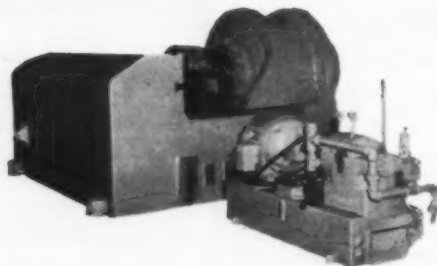
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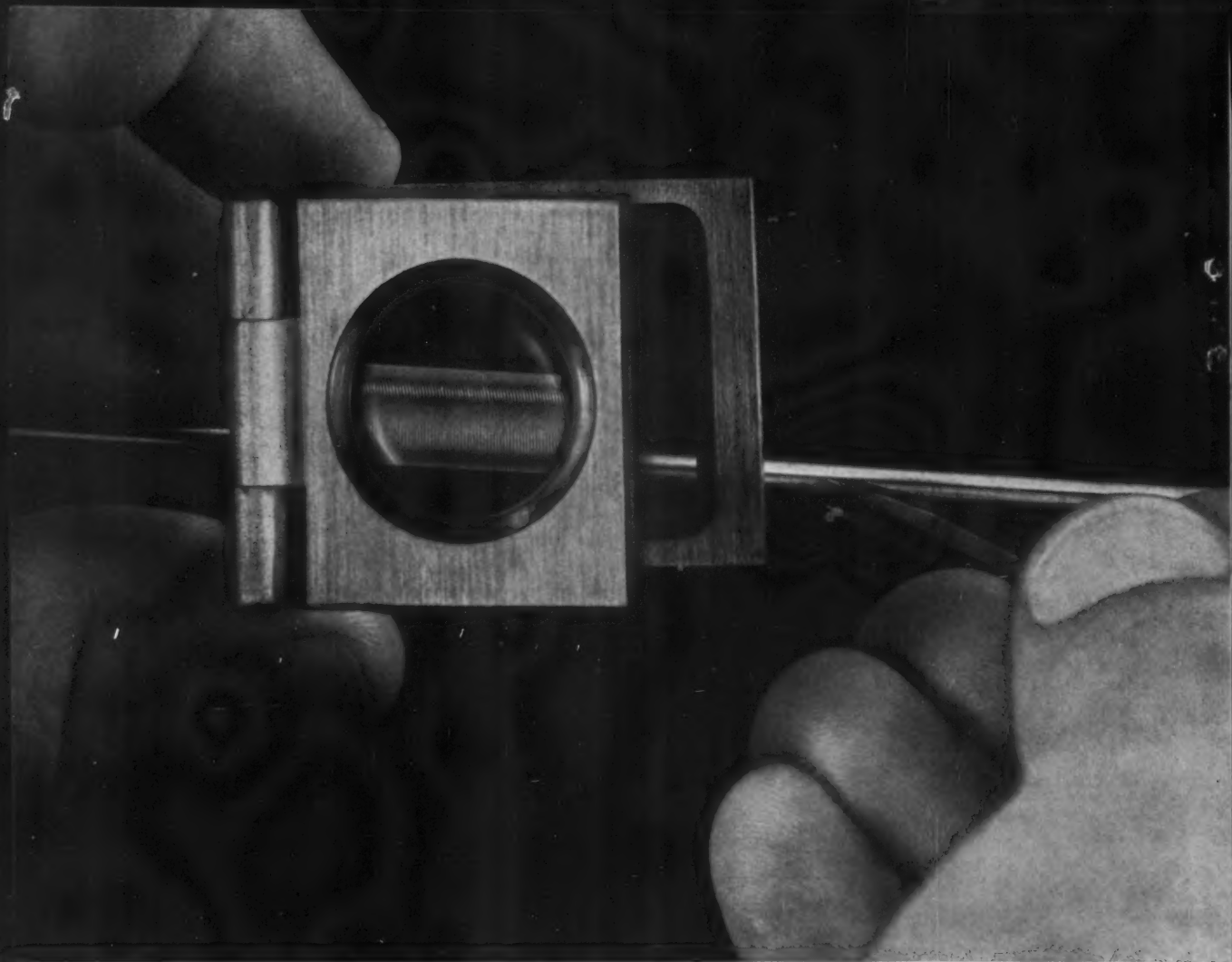
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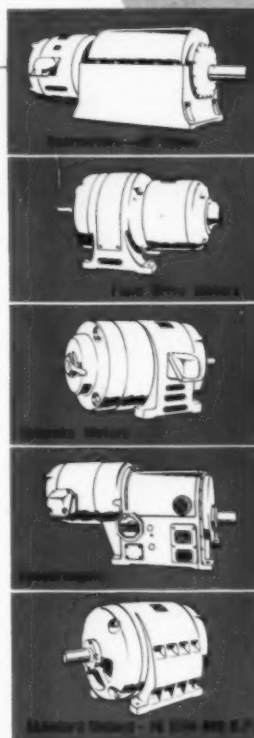
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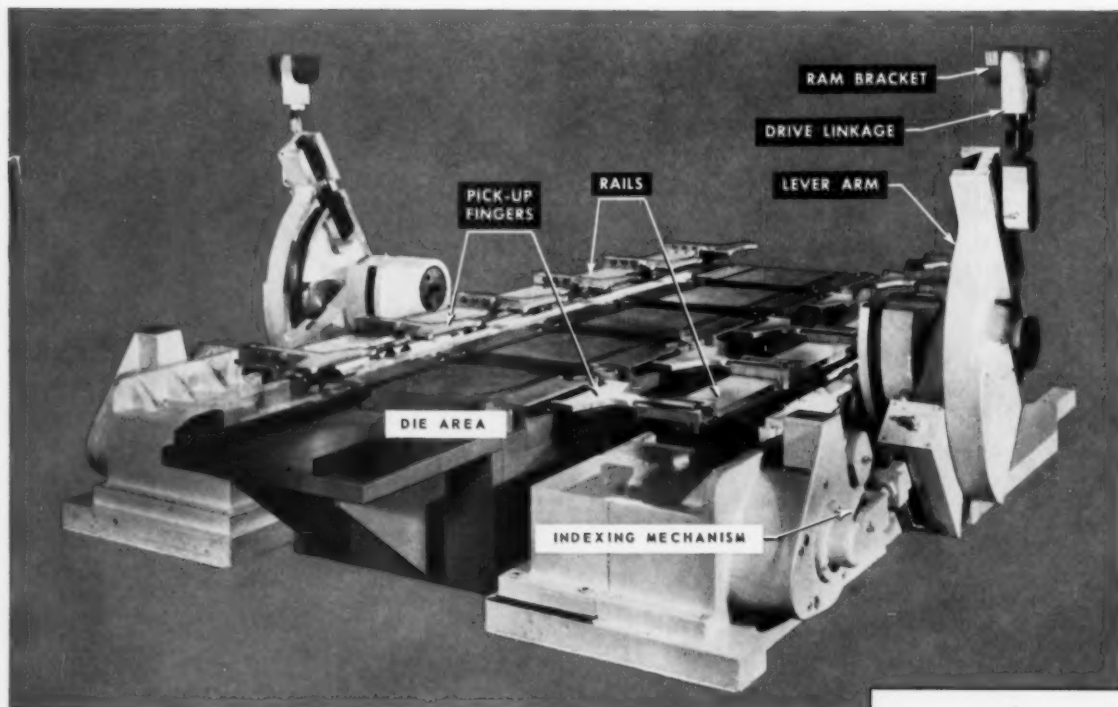
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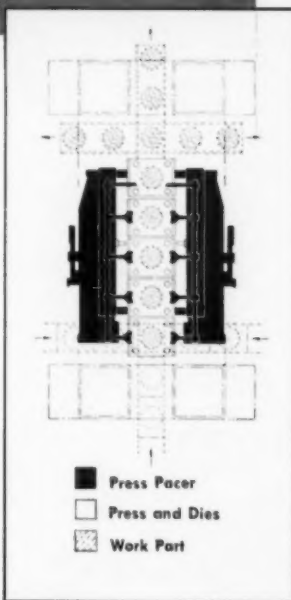
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